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CATALOGUE OF THE POLYNESIAN *MITRIDÆ*, WITH
REMARKS ON THEIR GEOGRAPHICAL RANGE, STA-
TION, AND DESCRIPTIONS OF SUPPOSED NEW
SPECIES.

BY ANDREW GARRETT.

The family *Mitridæ*, which includes some of the most beautiful shells as regards elegance of form, sculpture and color, is represented in Polynesia by nearly 200 species, many of which are very rare.

They inhabit various stations; many being strictly reef shells, where they lurk in holes and crevices under sea-weed, but are most generally concealed under stones and blocks of dead coral. Others burrow in sand or sandy-mud at various depths; some delight in stony ground inside the reefs, where they remain concealed under clumps of coral during the day, and like the sand species are nocturnal in their habits. All the species belonging to the section or subgenus *Zierlina* are found beneath

water-worn stones in the middle region of the littoral zone, on rocky coasts usually associated with *Veritæ*.

Every species enumerated in the following list were collected by the writer, so that the habitats, station and geographical range may be relied on as trustworthy.

Further exploration will I am sure add many more species to the list and modify the geographical range of others.

In addition to the 167 species collected by myself, I have added 29 species on the authority of other authors.

The Polynesian shells which have been described under the name of *Thala*, a subgenus of *Mitridæ*, are much more nearly related to *Pleurotomidæ* than with the former family, and with the exception of *Thala alba* and *T. saltata*, which are true *Mitræ*, I have excluded the others from this catalogue.

The structure of the folds or wrinkles on the columella are not true plaits, but simply more or less irregular transverse rugosities precisely of the same structure as observed in certain species of *Clathurella* and *Cithara*.

In fact the earliest known species was described by Dr. Mighels, under the name of *Pleurotoma todilla*. Mr. Reeve in his Monograph of *Mangelia* has described a Philippine species under the name of *Mangelia solida*. The latter is exactly the same shape, and the granulate sculpture, linear aperture and the columellar wrinkles do not differ from Polynesian species.

The above two species, together with *Thala anglostoma* Pease, and *T. exquisita* and *violacea* Garr., should be embraced in a new genus and removed to the family *Pleurotomidæ*.

I also exclude from the *Mitridæ* Mr. Pease's genus *Mitropsis*, which undoubtedly belongs to the family *Columbellidæ*.

		W. Polynesia.					E. Polynesia.				
		Viti Islands.	Tonga Islands.	Samoa Islands.	Kingsmill Isles.	Caroline Isles.	Cook's Islands.	Society Islands.	Panmotu Islands.	Marquesas Isles.	Sandwich Isles.
1	Mitra	adusta Mart.	...	...	x	x	x	x	x		x
2	"	ambigua Swains.	...	...	x			x	x		
3	"	annulata Reeve	...	...				x			
4	"	astricta Reeve	...	...						x	x
5	"	amphorella Lam.	...	...	x				x		
6	"	ancillides Swains.	...	...					x		
7	"	aurora Dohrn	...	...			x	x	x		x
8	"	anthracina Reeve	...	...	x						
9	"	alba Pease...	...	...				x	x		
10	"	assimilis Pease...	...	...						x	
11	"	abbatis Chem.	...	...				x			
12	"	brumalis Reeve...	...	...	x	x	x	x	x	x	x
13	"	cardinalis Grov.	...	...	x	x	x	x	x	x	x
14	"	chrysostoma Swains.	...	...	x	x	x	x	x		
15	"	chrysalis Reeve	...	...	x	x	x	x			
16	"	coronata Chem.	...	...	x	x	x	x	x		
17	"	corulea Reeve	...	...	x			x	x	x	
18	"	cucumerina Lam.	...	...	x	x	x	x	x		x
19	"	caeligena Reeve	...	...						x	
20	"	digitalis Chem...	...	...	x	x	x	x			
21	"	episcopalis L.	...	...	x	x	x	x	x		x
22	"	eburnostoma Garr.	...	...						x	
23	"	eburnea Garr.	...	...					x		
24	"	fasciata Mart....	...	...				x	x		
25	"	fusescens Pease	...	...					
26	"	flammea Q. & G.	...	...	x	x	x				x
27	"	ferruginea Lam.	...	...	x	x	x	x	x	x	
28	"	fulva Swains.	...	...	x	x	x	x	x	x	
29	"	filosa Born.	...	...	x				x		
30	"	humeralis Garr.	...	...						x	
31	"	ignobilis Reeve	...	...	x			x			
32	"	interlirata Reeve	...	...	x						
33	"	latruncularia Reeve	...	...	x						

		W. Polynesia.					E. Polynesia.				
		Viti Islands.	Tonga Islands.	Samoa Islands.	Kingsmill Isles.	Caroline Isles.	Cook's Islands.	Society Islands.	Panmotu Islands.	Marquesas Isles.	Sandwich Isles.
67	<i>Mitra versicolor Mart.</i> ...	x	x								
68	„ sp. ...	x									
69	„ sp. ...			x							
70	„ sp. ...	x									
71	„ sp. ...			x							
72	<i>Strigatella acuminata Swains.</i>	x	x	x	x	x	x	x	x	x	x
73	„ <i>auriculoides Reeve</i> ...	x	x	x	x	x	x	x	x	x	x
74	„ <i>brunnea Pease</i> ...	x		x		x		x	x		x
75	„ <i>columbellæformis Kien.</i>				x		x	x	x		
76	„ <i>litterata Lam.</i> ..	x	x	x	x	x	x	x	x		x
77	„ <i>maculosa Reeve</i> ..	x	x	x	x	x	x	x	x		x
78	„ <i>paupercula L.</i> ...	x	x	x	x	x					
79	„ <i>virgata Reeve</i> ...	x	x	x	x	x					
80	„ <i>zebra Garr.</i> ...	x		x							
81	<i>Turricula amabilis Reeve</i> ...	x	x	x	x		x	x	x		
82	„ <i>aurantia Swains.</i> ...								x		
83	„ <i>amanda Reeve</i> ...	x									
84	„ <i>assimilis Garr.</i> ...	x		x			x				
85	„ <i>angulosa? Mart.</i> ...	x									
86	„ <i>bilineata Reeve</i> ...	x									
87	„ <i>bella Pease</i> ...										x
88	„ <i>bicolor Garr.</i> ...			x					x		
89	„ <i>Cumingii Reeve</i> ...			x					x		
90	„ <i>cadaverosa Reeve</i> ...	x		x				x	x		
91	„ <i>concinna Reeve</i> ...	x		x							
92	„ <i>crocata Lam.</i> ...	x	x	x			x	x			
93	„ <i>consanguinea Reeve</i> ...	x	x	x	x		x	x	x		
94	„ <i>crebrilirata Reeve</i> ...	x									
95	„ <i>concentrica Reeve</i> ...	x									
96	„ <i>cruentata Chem.</i> ...	x									
97	„ <i>cimelium Reeve</i> ...							x	x		
98	„ <i>crispa Garr.</i> ...	x		x							
99	„ <i>castanea Garr...</i> ...	x		x							

			W. Polynesia.					E. Polynesia.				
			Viti Islands.	Tonga Islands.	Samoa Islands.	Kingsmill Isles.	Caroline Isles.	Cook's Islands.	Society Islands.	Panmotu Islands.	Marquesas Isles.	Sandwich Isles.
100	<i>Turricula</i>	<i>diachroa</i> <i>Ads. & Reeve</i>	x	x	x							
101	"	<i>discoloria</i> <i>Reeve</i>	...	x								
102	"	<i>exasperata</i> <i>Chem</i> ...		x	x	x	x					
103	"	<i>exquisita</i> <i>Garr.</i>	...	x		x		x	x	x		
104	"	<i>Emiliæ</i> <i>Schmeltz</i> ...									x	
105	"	<i>flammulata</i> <i>Pease</i>	...	x	x	x		x	x	x		
106	"	<i>flexicostata</i> <i>Garr.</i> ...		x						x		
107	"	<i>festiva</i> <i>Garr.</i>...	...	x								
108	"	<i>fusco-nigra</i> <i>Garr.</i> ...		x								
109	"	<i>fortiplicata</i> <i>Pease</i>	...							x		
110	"	<i>Gruneri</i> <i>Reeve</i>	...			x						
111	"	<i>Hoyti</i> <i>Garr</i>...	...	x								
112	"	<i>instricta</i> <i>Garr</i>	...	x								
113	"	<i>lyrata</i> <i>Lam</i>...	...	x								
114	"	<i>luteo-fusca</i> <i>Garr.</i> ...						x				
115	"	<i>luculenta</i> <i>Reeve</i>	...	x	x	x						
116	"	<i>leucodesma</i> <i>Reeve</i>		x								
117	"	<i>lauta</i> <i>Reeve</i>...	...	x	x	x	x	x	x	x		x
118	"	<i>laevicostata</i> <i>Garr.</i> ...								x		
119	"	<i>microzonias</i> <i>Lam.</i>	...	x	x	x	x		x	x		
120	"	<i>mucro ata</i> <i>Swains.</i>							x	x		
121	"	<i>millicostata</i> <i>Swains.</i> ...								x		
122	"	<i>modesta</i> <i>Reeve</i> ...		x		x						
123	"	<i>multicostata</i> <i>Swains.</i> ...		x		x		x	x	x		
124	"	<i>Michauii</i> <i>Cr. et Fisch.</i>		x	x							
125	"	<i>modicella</i> <i>Garr.</i>	...							x		
126	"	<i>nodosa</i> <i>Swains.</i> ...		x	x	x	x	x	x	x		x
127	"	<i>obeliscus</i> <i>Reeve</i>	...	x								
128	"	<i>purpurata</i> <i>Reeve</i> ...								x		
129	"	<i>patriarchalis</i> <i>Gmel.</i>	...	x		x						
130	"	<i>Pacifica</i> <i>Reeve</i> ...		x		x			x	x		
131	"	<i>plicata</i> <i>Klein</i>...	...				x					
132	"	<i>porphyretica</i> <i>Reeve</i> ?		x		x						

			W. Polynesia.					E. Polynesia.				
			Viti Islands.	Tonga Islands.	Samoa Islands.	Kingsmill Isles.	Caroline Isles.	Cook's Islands.	Society Islands.	Panmotu Islands.	Marquesas Isles.	Sandwich Isles.
133	<i>Turricula pulchra</i>	<i>Garr.</i>	...	x	x							
134	"	<i>putillus Pease</i>	...						x	x		
135	"	<i>Peasei Garr.</i>	...	x								
136	"	<i>propinqua Garr.</i>	...	x								
137	"	<i>rosea Swains.</i>	...							x		
138	"	<i>rubra Swains.</i>	...							x		
139	"	<i>subulata Lam.</i>	...	x								
140	"	<i>semifasciata Lam.</i>	...	x	x							
141	"	<i>stigmataria Lam.</i>	...	x								
142	"	<i>speciosa Reeve</i>	...					x		x		
143	"	<i>tusa Reeve</i>	...		x				x	x		x
144	"	<i>unilineata Garr.</i>	...	x								
145	"	<i>vittata Swains.</i>	...	x								
146	"	<i>variata Reeve</i>	...	x	x			x	x	x		
147	"	<i>vulpecula L.</i>	...	x								
148	"	<i>Zebuensis Reeve?</i>	...	x								
149	"	<i>sp.</i>	...	x								
150	"	<i>sp.</i>	...							x		
151	"	<i>sp.</i>	...				x					
152	"	<i>sp.</i>	...							x		
153	"	<i>sp.</i>	...	x								
154	"	<i>sp.</i>	...	x								
155	"	<i>sp.</i>	...							x		
156	"	<i>sp.</i>	...	x								
157	<i>Cylindra nucea</i>	<i>Gron.</i>	...	x	x	x	x	x	x	x		x
158	"	<i>dactylus L.</i>	...	x	x	x	x	x		x		x
159	"	<i>crenulata Chem.</i>	...	x	x	x	x	x		x		x
160	"	<i>fenestrata Lam.</i>	...	x					x	x		
✓ 161	<i>Imbricaria</i>	<i>Olivæformis Swains.</i>	...	x	x	x	x		x	x		x
162	"	<i>conica Schum.</i>	...	x	x			x	x	x		
163	"	<i>punctata Swains.</i>	...	x	x	x		x	x	x		
164	"	<i>virgo Swains.</i>	...	x	x	x	x	x	x	x		x
165	"	<i>Vanicorensis Q. et G.</i>	...	x								

W. Polynesia. E. Polynesia.

166 *Mitroidea multiplicata* Pease ...167 *Dibaphus Philippii* Crosse ...

	Viti Islands.	Tonga Islands.	Samoa Islands.	Kingsmill Isles.	Caroline Isles.	Cook's Islands.	Society Islands.	Panmotu Islands.	Marquesas Isles.	Sandwich Isles.
117 species	x		x			x	x	x		x
46 species										
73 species										
42 species										
36 species										
41 species										
64 species										
75 species										
6 species										
31 species										

132 species were found in Western Polynesia, 72 of which did not occur to our notice in Eastern Polynesia.

In Eastern Polynesia we obtained 96 species, 35 of which were not found in Western Polynesia.



Genus MITRA Lamarck.

1. **Mitra adusta** Martin. Reeve, Conch. Icon., pl. iv., fig. 25.

Excepting the Marquesas, we obtained this species in all parts of Polynesia, but comparatively rare in every group except the Viti Islands, where they occurred in abundance in a single location in the eastern portion of Vanua Levu. They were found congregating in numbers of all ages, beneath large masses of dead coral near low water mark.

Reeve's figure is much lighter colored than any South Sea examples, and has the appearance of a weathered shell.

2. **Mitra ambigua** Swainson. Reeve, l. c., pl. ii., fig. 8a, 8b.

Not uncommon under large blocks of coral near low water mark, Viti Islands; more rare at Samoa and very scarce at the Society and Panmotu Islands. Examples obtained at the two latter groups are less than an inch in length and have the subsutural band very clearly defined.

Viti specimens attain a length of two inches, which is smaller than Reeve's figure of a Philippine shell. Our shells are darker colored, more slender, and the aperture more contracted than the above mentioned figure.

3. **Mitra annulata** Reeve. l. c. pl. xiv. fig. 103.

A rare species, found burrowing in clear sand in the upper region of the laminarian zone, inside the reefs at the Society Islands.

Mr. Reeve who records it from Zanzibar, does not mention the color; and his figure which agrees very closely in shape and sculpture with our shells, is, like many of his figures carelessly colored.

Society Island examples are livid-white, sometimes stained with light ferruginous, and more or less mottled and

longitudinally striped with brown. Aperture white, with a slight orange-brown tinge deep in the throat.

The transverse ridges are rather sharp, their interspaces with or without the smaller ridges, and longitudinally with closely-set incised lines.

It is closely allied to, but quite distinct from *M. flammea* Quoy and Gaimard (not of Reeve), and *M. interlirata* Reeve.

Paetel records it from New Caledonia.

The animal is creamy white, profusely maculated with small irregular opaque-white spots, and the anterior portion of the foot, base of tentacles and siphon tinged with brown.

4. *Mitra astricta* Reeve, l. c., pl. xxiv., fig. 188.

This somewhat rare species only occurred to my notice at the Sandwich and Marquesas Islands, where they were found near low water mark on rocky coasts.

21 The color varies from light yellowish-brown to olive-brown, with or without the five transverse brown lines and subsutural pale band mentioned by Reeve. The surface is more or less striated parallel to the axis of the shell, and the upper whorls are finely granulated.

5. *Mitra amphorella* Lamarck. Reeve, l. c., pl. xii., 83a, 83b.

Not uncommon at the Viti, and very rare at the Panmotu Islands, where they were found beneath masses of dead coral on the shore or fringing reefs.

24 Viti examples which are larger than Panmotu specimens, differ considerably in the size of adults, which in shape are about intermediate between Reeve's two figures, which are colored precisely the same as our shells. The spiral incised lines or grooves are generally obsolete on the middle of the body whorl and are either simple or punctated.

It is frequently referred to the genus *Strigatella*; but as none of my examples exhibit the peculiar peristome of that

genus, I think its position should be in the subgenus *Nebularia*.

6. *Mitra ancillides* Swainson. Reeve, l. c., pl. xxxviii., fig. 319.

47 An exceedingly rare species of which I found two dead but perfect examples washed up on the outer beach at Anaa, one of the Paumotu Islands.

Mr. Swainson's type specimens were collected by Cuming in the same locality. My largest example is 20 mill. in length, and both are creamy-white with a very faint luteous tinge. The upper whorls are granulated and the columella six-plaited.

7. *Mitra aurora* Dohrn. Proc. Zool. Soc. 1861, p. 205, pl. xxvi., fig. 3.

47 This rare and beautiful species occurred to our notice at the Sandwich, Society, Cook's and Paumotu Islands, where they were all found washed up from deep water on the outer reefs. All my examples are in the condition of more or less perfect dead shells.

The colour, which varies from light orange to orange-red, is undoubtedly darker in the living shells, and is more or less freckled and striped with white.

The late Mr. Pease considered it a large variety of *Mitra coronata*. It appears to me, however, sufficiently distinct to rank as a separate species.

My largest examples which were found at Anaa, Paumotu Islands, are 45 mill. in length, which is nearly twice the size of Polynesian specimens of *coronata*. As compared with the latter, the whorls are not spirally ridged, the incised lines are finer, the punctures smaller, more crowded, and the columella has one more plait. 47

Polynesian examples of *coronata* are dark brown with a tawny-yellow subsutural band, and the whorls are encircled

with convex ridges. They also inhabit different stations and belong to different subgenera.

8. **Mitra anthracina** Reeve, Conch, Icon., pl. xviii., fig. 137.

This is also a very rare species of which I found two examples under stones, in the middle region of the littoral zone, at Taviuni, Viti Islands.

Our shells are a little smaller and the spire is more robust than represented in Reeve's figure.

9. **Mitra alba** Pease, *Thala alba*, Pease, Amer, Jour. Conch., 1867, p. 215, pl. xv., fig. 8.

A few examples of this small rare species were found in beach sand at the Paumotu and Society Islands.

Its small size, (8 mill.) uniform glossy white color and fine spiral impressed striæ will readily distinguish it.

Mr. Pease referred it to the genus *Thala*. It should I think be embraced in the subgenus *Mutya*.

10. **Mitra assimilis** Pease, l. c., 1867, p. 211, pl. xv., fig. 1.

Three dead specimens found beneath stones in the lower region of the littoral zone at the Marquesas group.

They agree in every particular with Mr. Pease's description and figure, except in being a little smaller and the pale subsutural band not so distinctly defined.

11. **Mitra abbatis** Chemnitz. Reeve, Conch. Icon., pl. xiii. fig. 91.

This, which is one of our rarest South Sea Mitres, has occurred to us only in the condition of beach shells, at Huahine, Society Islands.

Reeve's figure which represents a Philippine example, though one third larger than Polynesian, agrees in every other particular with our shells.

12. **Mitra brumalis** Reeve, l. c., pl. xxxiv., fig. 280.

Occurs beneath dead coral on reefs, and, excepting the

Marquesas, ranges throughout Polynesia. A large series of specimens connect it with *M. pellis-serpentis*, Reeve.

It is more common in the western groups than elsewhere.

The animal is uniform pale luteous.

13. **Mitra cardinalis** Gronovius. Reeve, l. c., pl. iv., fig. 26.

This fine species, which is not very common, is usually found in shallow water inside the reefs and is generally diffused throughout Polynesia. We have collected examples in all the groups except the Marquesas Isles.

The animal is uniform creamy-white.

14. **Mitra chrysostoma** Swainson. Reeve, l. c., pl. ii., fig. 12.

Common under dead coral on the inner margins of the outer reefs at the Samoa Islands; less abundant at all the other western groups. In Eastern Polynesia it is rarely found at the Society and Panmotu Islands.

15. **Mitra chrysalis** Reeve, l. c., pl. xxv., fig. 200.

Common under dead coral on the reefs at the Viti, Tonga and Samoa Islands; more rare in the Kingsmill group.

It is very closely allied to *M. cucumerina*, from which it differs in its smaller size, less robust form and different color. Our specimens which are larger than Reeve's figure, are 23 mill in length.

16. **Mitra coronata** Chemnitz. Reeve, l. c., pl. xiv., fig. 104a, 104b.

Excepting the Marquesas, we found a few examples of this species at all the South Sea groups. They live under coral on the outer and inner reefs.

The animal is brown, the margins of the foot and tentacles white.

All our examples are very uniform in their specific characters, except a slight variation in the size of the white sutural nodules. They are smaller and more contracted

towards the base than represented in Reeve's figures of Philippine specimens.

17. *Mitra cærulea* Reeve, l. c., pl. xv., fig. 113.

A rare species of which we found four dead but perfect specimens on the fringing reefs at Kioa, Viti Islands.

They were undoubtedly washed up from sandy bottoms outside the reefs. Though a little smaller and narrower towards the base than represented in Reeve's Philippine example, they agree in every other particular with his figure and description. One specimen has the "white flake-like spots" nearly obsolete, and the whole shell is regularly grooved longitudinally so that the sculpture closely resembles that of *Mitra sphaerulata*.

18. *Mitra cucumerina* Lamarck. Reeve, l. c., pl. xxv., fig. 201. *Voluta ferrugata* Solender, MS.

A common and variable species found on reefs, and excepting the Marquesas is generally diffused throughout Polynesia. Panmotu examples, which are much larger than obtained elsewhere, are sometimes nearly uniform white. The animal is whitish with creamy-yellow dots.

19. *Mitra cæligena* Reeve, l. c., pl. xxviii., fig. 227.

Four dead examples found under stones at the Marquesas Islands.

They agree in every particular with Reeve's description, but are rather darker coloured than his figure and the pale band is less decided.

20. *Mitra digitalis* Chemnitz. Reeve, l. c., pl. iii., fig. 21.

Obtained sparingly in all the western groups where they were found washed up on the outer reefs.

21. *Mitra episcopalis* L. Reeve, l. c., pl. i., fig. 5.

This fine and well-known species, which is more abundant at the Society Islands than elsewhere, occurs in all parts of Polynesia except the Marquesas. They live inside

the reefs on sandy bottom in the upper region of the laminarian zone.

They differ remarkably in the size of adults, averaging from $2\frac{1}{2}$ to 6 inches in length. We have now before us a fine Society example which is a little larger than Reeve's beautiful figure.

22. *Mitra eburnostoma* sp. nov.

Shell cylindrically fusiform, solid, creamy-white, sparingly mottled with brown; spire rather long with slightly convex outlines; suture crenulate; whorls 9, flatly convex, spirally ridged, ridges rather small, unequal, angular, decussated by longitudinal incised lines which gives the surface a depressly granulated appearance; aperture ivory-white, half the length of the shell; columella with four plaits.

Length 41, diam. 13 mill. (Coll. Garrett).

227 Hab. Papmotu Islands.

A very rare species of which we found two examples buried in sand in the upper region of the laminarian zone.

The sculpture is almost precisely the same as in *M. sphaerulata*, but may be at once distinguished from that species by its paler color, more slender form and pure white aperture. The latter character connects it with *M. scabriuscula*, but the sculpture is quite different in the two species, and the shape is more regularly fusiform. The outlines are exactly similar to *M. fasciata*.

23. *Mitra eburnea* sp. nov.

Shell small, fusiform, smooth, shining, base strongly recurved, ivory-white; spire rather long, acute, with flattened outlines; whorls embryonal 2, smooth, normal whorls 8, planiform, last one convex, strongly contracted at the base; striated with rather crowded spiral impressed lines and the upper whorls with fine spiral granulated ridges; aperture

half the length of the shell, and furnished with 5 columellar plaits.

Length 12 mill. (Mus. Godeffroy).

Hab. Panmotu Islands.

We found two perfect dead specimens of this very rare *Mitra* on the sands at Anaa Island.

It is closely allied to *M. ancillides* but may be distinguished by its ivory-white color, more contracted base, smaller size and more robust form.

24. *Mitra fasciata* Martyn. Reeve, Conch. Icon., pl. vi., fig. 40.
Voluta casta, Solander, MS.

This appears to be a somewhat rare species, and occurred to our notice only at the Marquesas, Society and Cook's Islands. They live in sandy-mud in the laminarian zone.

Mr. Reeve is correct in stating that the broad brown band is superficial. Weathered shells are uniform white. The above author's figure, though very accurate, represents a poor specimen. Fine examples have a sharply defined, shining, deep brown-black zone.

25. *Mitra fusescens* Pease. *Mitra (Volutomitra) fusescens*
"Pease," Paetel, Cat. Conch., p. 40.

Strigatella fusescens, "Pse." Carpenter, Proc. Zool. Soc. 1865.

I gathered a few examples of this species on the rocky coasts of Hawaii, Sandwich Islands, where it appears to be peculiar.

It can scarcely be distinguished from *M. Ticaonica*, except in being small and having a smoother peristome.

26. *Mitra flammea*, Quoy et Gaimard, Voy. Astrol., vol. 2, p. 659, pl. xlv., fig. 23-25, *Mitra flammigera*, Reeve, Conch. Icon., pl. xxii., fig. 173a, 173b.

Common in the Viti Group, where I obtained many

living specimens by digging in coarse sand at low water mark inside the reefs. It is much more rare at 'Tonga and Samoa. Mr. Pease records it from the Sandwich Islands.

The shell Mr. Reeve described and figured as *flammea*, is not that species, but=*M. Philippinarum* Adams, and his *M. flammigera* is the *flammea*, Q. & G. *Mitra foveolata*, Dunker, is probably a synonym of the latter.

Reeve's description and figure are evidently taken from a discolored specimen. The living shell is a pale olivaceous-grey, mottled and striped with slate color. The aperture and upper half of the columellar lip are blackish-brown and the inner margin of the peristome is whitish. The intermediate ridges mentioned by Reeve are not constant.

27. *Mitra ferruginea* Lamarck. Reeve, Conch, Icon., pl. iv., fig. 28.

Obtained in all parts of Polynesia, except the Marquesas and Sandwich Islands; and more abundant at the Society and Paumotu groups than elsewhere. Invariably found lurking beneath masses of dead coral on reefs.

The animal is cinereous or pale luteous and slightly varied with reddish-brown.

28. *Mitra fulva* Swainson. Reeve, l. c., pl. iv., fig. 24, pl. vi., fig. 45.

Much more rare than the preceding species, and has the same range and station.

Animal chestnut brown, the creeping disk white and the siphon pale brown. The ocular region and tips of the tentacles, white.

Viti examples are more attenuated than specimens inhabiting the other groups. Reeve's variety "*attenuata*" is the most common form.

29. *Mitra filosa* Born. Reeve, l. c., pl. xi., fig. 81a.

This somewhat rare and graceful species only occurred

to our notice at the Viti and Society Islands, where they were obtained in coral sand on the fringing reefs. They are excessively rare and much smaller at the latter group.

Our largest specimens are smaller, lighter colored and more slender than represented in Reeve's figure 81*a*, which has the spiral ridges too large.

It differs from *nexilis* in its much more attenuated form, longer and more slender spire, lighter color, finer and more distant lirulæ, more produced and contracted base. They also inhabit different stations.

Linnæus' *Voluta filaris* may possibly be the same as our shell.

30. **Mitra humeralis** sp. nov.

Shell small, solid, fusiform, smooth, glabrous, spire acute, base contracted; whorls 7-8, flattened, the last one convex, obliquely striated toward the base; body and penultimate whorl margined next to the suture with an obtuse keel; aperture contracted above, half the length of the shell; peristome slightly sinuous and thickened above; columella with five plaits; color white, the body with two and the spire with one broad yellowish spiral band.

Length 10 mill. (Mus. Godeffroy).

Several more or less perfect examples found in beach sand on the outer coast of Anaa, Panmotu Islands. As compared with *M. peculiaris* it is more robust, and differs in the number and position of the bands, as well as in the absence of spiral striæ.

31. **Mitra ignobilis** Reeve. Conch. Icon., pl. xx., fig. 152.

I obtained two dead but perfect examples of this very rare species on the shore reefs at the Viti group, and a single less perfect one at Huahine, one of the Society Islands.

My largest Viti specimen is one-third larger, and the spire is more produced than the Philippine example figured

by Reeve. The grooves are more or less distinctly punctured, and the spots as represented in Reeve's very accurate figure are disposed in three transverse series on the body whorl. The largest specimen shows the "hair-like" lines mentioned by the above author.

32. **Mitra interlirata** Reeve? l. c., pl. x., fig. 70.

I am somewhat doubtful in regard to the correctness of the identification of the single discolored example now before me, which was found on a sandy-mud flat in the Viti group.

Mr. Reeve's description accords better with our shell than his figure; but as some of his species are poorly delineated, the latter may also be somewhat imperfect.

The spiral ridges are smaller and more compressed than in *M. flammea*, and the one on the shoulder is larger and more prominent than the others. The intermediate smaller ridges mentioned by the above author are confined to the middle of the shell. The whorls of the spire have three spiral ridges, the middle one the larger; *flammea* has four of nearly equal size. The color which is too much faded to be of any use in a comparison, appears to have been mottled similar to the latter species. The aperture seems to have been white.

Mr. Pease considered *interlirata* to be a variety of *flammea*. It is at least very closely related to the latter.

33. **Mitra latruncularia** Reeve, l. c., pl. xxi., fig. 166.

We were fortunate in finding six dead but very perfect specimens of this pretty species on the Kioa shore reefs, Viti Islands.

Our examples are a little smaller and more slender than Reeve's figure which is not very correctly colored. The whole surface is beautifully checkered with numerous small chestnut-brown square spots.

34. *Mitra lugubris* Swainson. Reeve, l. c., pl. xxi., fig. 166.

Mitra (*Chrysame*) *lacunosa* Schmeltz. Cat. Mus. Godeff. No. iv., p. 83. *Mitra* (*Scabricula*) *lacunosa* Paetel. Cat. Conch., p. 40. *Mitra lugubris* Schmeltz. Cat. Mus. Godeff., No. v., p. 117.

Excepting the Marquesas and Cook's Islands, we found this species distributed throughout Polynesia. Though not uncommon in the Western groups it is very rare elsewhere, and occurs in reefs.

Our shells are colored the same as stated by Reeve and represented in his figure; but the latter is more ventricose, and the description reads "*shell ovate*," whereas our shells are precisely the shape of his *lacunosa*, which he describes as "*oblong-ovate*." He states that *lugubris* is "*encircled with impressed striae*." Several very perfect specimens now before me are all transversely ridged, the ridges more or less convex or angulate and the conspicuously grooved interspaces are punctured. The whole surface is also more or less distinctly grooved longitudinally. The aperture is white or bluish-white and the upper half of the columella lip is deep brown.

It will be observed that the sculpture of our shells are precisely the same as *lacunosa*, but he represents the colors as different, and states that the columella has only four plaits, one less than the shells under consideration.

I am inclined to believe the two species are identical. Reeve's *lacunosa* may have been discolored, and his *lugubris* may have had the transverse ridges so much flattened that the shell appeared to be simply grooved.

The Pacific shells which are shaped and sculptured like the former, with the precise coloration of the latter, are by some authors referred to *lacunosa* and by others to *lugubris*.

35. *Mitra muriculata* Lamarck. Reeve, l. c., pl. xxvi., fig. 205.

A single specimen found washed up on the beach on

the south coast of Vanua Levu, Viti Islands.

It agrees in every respect with Reeve's figure except in being smaller and less robust.

36. **Mitra micans** Reeve, l. c., pl. xxxiv., fig. 285.

One dead but perfect example was obtained on the Rarotonga reef, Cook's Islands.

37. **Mitra nevia** Swainson. Reeve, l. c., pl. vi., fig. 41.

This very rare and graceful species was obtained at Anaa, Panmotu Islands, where we found four tolerably perfect dead shells, and a single much weathered specimen was picked up on the Rarotonga reef, Cook's Islands.

The color is creamy-white, with a few small, irregular, pale brown sutural spots. One example exhibits a few imperfect rows of minute dots of the same color in the transverse grooves.

38. **Mitra nexilis** Martyn. Reeve, l. c., pl. xi., fig. 81b.

Excepting the Marquesas, we obtained this species in more or less abundance at all the South Sea groups, but much more common at the Society, Tonga and Viti Islands than elsewhere. They are invariably found on sandy bottoms inside the reefs.

Our finest examples which were obtained in the Viti and Tonga groups are a little larger than Reeve's excellent figure, and like the latter the spiral cord next the suture is quite obsolete. Society Island specimens are smaller, darker colored and the sutural cord is fully developed.

Contrary to the views of most writers I fully believe this to be a distinct species from *M. filosa* Born.

39. **Mitra nebulosa** Swainson. Reeve, l. c., pl. i., fig. 3.

A rare species of which I found two dead but very perfect examples on the fringing reef near Sandal-Wood Bay, Viti Islands.

Our specimens have the whorls more flattened than

represented in Reeve's figure, and one exhibits the same color and markings. The other is ornamented with numerous narrow longitudinal reddish-brown stripes which are minutely dotted with white. The columella has five plaits.

I am inclined to believe the latter is the form which Dillwyn describes under the name of "*Voluta nubila*" Gmel. variety A, which he says has "*longitudinal interrupted reddish-brown stripes and the pillar five plaited.*"

It is very nearly related to *M. versicolor* Martyn, which is Dillwyn's *Voluta nubila* variety B.

Mr. Reeve on the authority of Mr. Cuming gives Anna, Paumotu Islands as the habitat, which is probably an error.

40. **Mitra oleacea** Reeve, l. c., pl. xiv., fig. 105.

A few examples obtained under large clumps of coral on reefs at the Samoa, Viti and Society Islands.

The spiral incised lines are occasionally obsolete on the middle of the body whorl, and the color though usually olivaceous is sometimes of different shades of brown.

41. **Mitra propinqua** sp. nov.

Shell solid, elliptically-oblong, chestnut-brown with an indistinct irregular pale line on the upper third of the body whorl; aperture and a few small spots near the base, whitish; spire rather short, with slightly convex outlines, suture grooved; whorls 6-7, flat, last one large, convex, all with regular spiral incised lines which are closely punctured; aperture equal to half the length of the shell; outer lip crenulated and the columella with five plaits.

Length 28, diam. 13 mill. (Coll. Garrett).

Hab. Society Islands.

This appears to be a rare species. They were taken from under coral on reefs. It is somewhat similar in shape to *M. punctata* Swain., and like that species is punctate-striate but differs in color and number of columellar plaits.

42. *Mitra peculiaris* Reeve. Conch. Icon., pl. xxxvi., fig. 305.

Two dead specimens found on the shore reef at Kioa, Viti Islands.

They agree in every particular with Reeve's description and figure, except in having fine spiral incised lines and one more columellar plait.

43. *Mitra pontificalis* Lamarck. Reeve, l. c., pl. iv., fig. 23.

Occurs in more or less abundance in all parts of Polynesia. The spiral punctures are not constant.

Animal creamy-white, with opaque-white dots.

44. *Mitra peregra* Reeve, l. c., pl. xxiv., fig. 186.

M. rotundilirata Pease (not of Reeve); Mus. Pease, 1863. *M. coriacea* Schmeltz (not of Reeve); Cat. Mus. Godeffroy, No. iii., p. 33. *Turricula (Pusia) spadicea* 'Dkr.' n. sp., Schmeltz, l. c., No. iv., p. 84; l. c., No. v., p. 119, 210. *Mitra (Pusia) coriacea* Paetel (not of Reeve); Cat. Conch., p. 39.

Under coral on reefs. Excepting the Marquesas and Cook's Islands, occurs in all the South Sea groups, but more abundant at Samoa and the Viti Islands than elsewhere.

I don't think there is much, if any doubt in respect to the correctness of the determination of this species, which agrees very closely with Reeve's short diagnosis and tolerably well with his indifferent figure.

Perfect shells are dark reddish-chestnut, the spiral ribs articulated with tawny-yellow, and the aperture is yellowish-brown. Weathered shells are dark red and the costal spots whitish.

Society Island specimens, which Mr. Pease received of me, were referred to Reeve's *rotundilirata*, which latter is quite a different species.

Mitra coriacea is more slender, and the sculpture and color quite different from our shells.

It belongs to the section or subgenus *Chrysame*, not *Turricula* nor *Pusia*.

45. **Mitra pellis-serpentis** Reeve, l. c., pl. x., fig. 66.

A rather scarce shell found under dead coral on the outer reefs in all the eastern groups except the Marquesas. We also obtained it at the Kingsmill Islands.

Society Island specimens, which attain a much larger size than Reeve's very accurate figure, vary considerably in the small decussated ridges, which become nearly obsolete in some individuals. All are densely striated parallel to the axis of the shell.

As previously stated, it is connected with *M. brumalis* by intermediate forms.

46. **Mitra papalis** Linnæus. Reeve, l. c., pl. ii., fig. 9.

This is a very rare South Sea shell, and only occurred to my notice at the Kingsmill and Caroline Islands. Mr. Reeve on the authority of Cuming gives Anaa, Panmotu Islands as its habitat. I very much doubt its occurrence there; at least after several months exploration in a dozen different islands of that group, and the examination of many collections made by others, I failed to discover a single specimen.

47. **Mitra procissa** Reeve, l. c., pl. xxii., fig. 177.

A few examples occurred under coral on the outer reefs at Samoa and Viti Islands.

Our shells are a little smaller and a trifle more robust than Reeve's figure, though in every other respect they accord closely.

48. **Mitra robusta** Reeve, l. c., pl. xviii., fig. 140.

We obtained this interesting species beneath large water-worn lava stones on rocky coasts, Viti Islands. They were all found in the upper half of the littoral zone, associated with *Patella*, *Littorina* and *Nerita*. It appears to be very

local and abundant at the above group and very rare at Samoa.

They vary in color from cinnamon-brown through all the intermediate shades to deep blackish-brown, and in shape from ovate to ovate-oblong. The latter form differs none from Reeve's description and figure of *M. Woldemarii*, which is very closely allied if not identical with our shells.

49. **Mitra rubritincta** Reeve, l. c., pl. xix., fig. 147.

A very rare species found under dead coral on reefs at Samoa and Viti Islands.

50. **Mitra retusa** Lamarck Ann. du Mus., vol. xvii., p. 217.

Voluta paupercula Schroeter; Einl., vol. i., p. 217, pl. i., fig. 11. *Voluta paupercula* (var.) Dillwyn, vol. i., p. 534. *Mitra virgata* Reeve (part); Conch. Icon., pl. xxv., fig. 197a. *M. retusa* Reeve, l. c., pl. xxv., fig. 199. *M. (Strigatella) retusa* Paetel; Cat. Conch., p. 41. *M. (Strigatella) virgata* Chenu; Man. Conch., vol. i., fig. 1001. *Strigatella retusa* Schmeltz; Cat. Mus. Godeff., No. v., p. 118.

Not uncommon under dead coral and in crevices on reefs, at all the Western groups.

This species has been confounded with *virgata* Reeve, and both with *paupercula* L. They are nevertheless quite distinct. The two latter belong to the genus *Strigatella*, and the species now under consideration is a true *Mitra* as restricted, and will fall in the section or subgenus *Nebularia*. It is in fact much more nearly related to *M. Ticaonica* than to the above two species, with which it has been united.

It is rather surprising that Mr. Reeve should have figured it to represent in part his *virgata* (fig. 197a). His fig. 197b, which is quite a different species should retain the latter name. Dr. Chenu's figure is an exact copy of Reeve's fig. 197a.

The latter author's *retusa*, fig. 199, has very much the aspect of a weathered or rubbed shell, and agrees exactly

with similar examples in my possession. In his description he does not allude to the crenulated peristome which is precisely the same as in *M. Ticaonica*; that is the crenulations occupy nearly the whole length of the lip.

The whole shell is longitudinally strigated with narrow white and deep brown stripes of nearly equal size, so that it is difficult to decide which is the ground color. With few exceptions all have a transverse whitish line on the upper portion of the body whorl. Perfect shells are invested with a thin translucent epidermis which gives the white strips a tawny-yellow color. The aperture and columella are dark brown with whitish plaits.

They vary in the convexity of the body whorl as in the length of the spire. The transverse impressed lines also vary in distinctness and are sometimes obsolete.

51. *Mitra subtexturata*, sp. nov.

Shell solid, ovate, cinereous, with a white aperture; spire short, less than half the length of the shell; whorls, 6, flat, last one large, strongly convex; sculpture consisting of moderately sized angular spiral ribs, 14 on the body, 5 on the penultimate whorl, the narrow interspaces very scabrous with crowded longitudinal laminæ-like striæ, and the whole shell more or less longitudinally guttered; columella, with 5 plaits, and the peristome thick and crenulated; length 19, diam., 11 mill., (Coll. Garrett.) Hab., Society Islands.

The animal is greyish-white, closely maculated with small irregular milk-white spots. The end of the siphon and the upper anterior portion of the foot stained with deep brown.

We obtained several examples in the upper region of the laminarian zone, sandy bottoms, at Raiatea Island.

It is somewhat related to *M. texturata*, but may be distinguished from that species by its uniform pale color,

more abbreviated form and the peculiar intercostal laminæ-like striæ.

52. **Mitra serpentina** Lamarck. Reeve, Conch. Icon., pl. xv., fig. 112a. 112b.

A rare and very beautiful species, of which we found a single dead, but very perfect example on the Kioa fringing reef, Viti Islands, and several more or less perfect ones in the Panmotu group. All the Mitres of this peculiar type burrow in sand.

Our shells are a little smaller than Reeve's largest figure, and have one columellar plait less than stated by the above author. The color is creamy-white, with two light orange bands on the body whorl, and ornamented with longitudinal more or less waved ferruginous lines and spots, which are most conspicuous on the bands, where they have white shadows.

53. **Mitra sphærulata** Martyn. Reeve, l. c., pl. v., fig. 37.

This fine species is generally diffused throughout Polynesia, and, excepting the Society Islands, occurs sparingly at all the groups. At Raiatea, one of the former group, it is so very abundant that I collected about 1500 specimens in a few days. Though very common in that particular locality, it is not by any means abundant elsewhere. They live in sand in the upper region of the laminarium zone. It appears to be absent from the Marquesas Islands.

They vary considerably in the size of adults, but not much in colour. The sculpture is remarkably uniform. It may be readily distinguished by its buff-colored aperture.

54. **Mitra spiripuncta** sp. nov.

Shell acuminate, turreted, slender, white, tinged with rose-red and spirally dotted with light brown, the dots confined to the ridges; whorls 9, spirally ribbed, the ribs slightly crenulated, four on the upper and fourteen on the

last whorl; interstices with two or three raised revolving lines; aperture narrow, a little less than half the length of the shell; outer lip rather thin and crenulated; columella with 5 plaits. Length 17 mill. (Mus. Godeffroy.)

Habitat Viti Island.

A single perfect example was obtained on the Koro reefs.

55. **Mitra scabriuscula** Linnæus. Reeve, Conch. Icon., pl. v., fig. 35.

This fine species is not uncommon at the Society, rare at the Panmotu, and very rare at the Viti Islands. It is invariably found in sandy stations, and *not* on reefs as stated by Reeve.

Our specimens are a little larger and more attenuated than Reeve's figure, which is shaped *too* much like *sphaerulata*, from which it differs in its more acuminate spire, more delicate sculpture and different color. The aperture is invariably pure white.

Dr. Græffe obtained examples at Upolu, Samoa.

The animal is diluted-white, maculated with numerous small opaque white spots.

56. **Mitra typha**, Reeve, l. c., pl. xxxiii., fig. 267.

We found four examples of this small rare *Mitra* on the fringing reefs at Kioa, Viti Island.

57. **Mitra tabanula** Lamarck. Reeve, l. c., pl. xxxix., fig. 332.

The single very perfect specimen now before me was obtained in the Viti group, but am unable to state the precise locality.

It agrees in every respect with Reeve's description, and very closely with his incorrectly colored figure. It is shaped like *M. turgida*, and is of a dark brownish-red color, with rather large, keel-like spiral ribs, which are very pale and smooth on their edges.

58. **Mitra testacea** Swainson. Reeve, l. c., pl. xiv., fig. 98.

A very rare species found in the condition of dead shells, on reefs, at the Kingsmill, Cook's, Society, and Panmotu Islands.

Varies considerably in the size of adults, and some examples have the spiral impressed lines so deeply cut that the surface appears to be corded with convex ribs.

59. **Mitra tessellata** Martyn. Reeve, l. c., pl. ii., fig. 10.

This fine large *Mitra* appears to be a scarce shell. A few examples were obtained on reefs at the Kingsmill, Society and Panmotu Islands. I also found two fine specimens at Guam.

Our largest example is 92 mill. in length, the same as Reeve's very accurate figure.

Animal creamy-yellow. The small triangular foot is reddish-brown above, and the siphon is varied with a lighter shade of the same color. The eyes are situated on the middle of the small tentacles.

60. **Mitra texturata** Lamarck. Reeve, l. c., pl. xx., fig. 155.

Four dead, but very perfect examples were collected on the fringing reefs, Viti Islands. Dr. Græffe obtained specimens at Samoa.

Viti shells are more robust and have a shorter spire than represented by Reeve's figure.

61. **Mitra tuberosa** Reeve, l. c., pl. xxx., fig. 237a, 237b.

Excepting the Marquesas, we found this species generally diffused throughout Polynesia; but appears to be rare everywhere except the Viti Islands, where they occurred in considerable numbers in crevices on the fringing reefs.

Our examples which are larger than Reeve's figure, which is slightly magnified, are whitish under a luteous epidermis, the base and the transverse band blackish brown.

62. **Mitra turgida** Reeve, l. c., pl. xxxiii., fig. 273.

M. ericea Pease; Proc. Zool. Soc., 1860, p. 146. *M. peregra* Schmeltz (not of Reeve); Cat. Mus. Godeffroy, No. iii., p. 33.

Common under dead coral at the Viti, Tonga and Samoa Islands, but rare at all the other groups, except the Marquesas and Cook's Islands, where it did not occur to our notice.

Reeve's figure which represents a Philippine example is not so much contracted at the base as noticed in South Sea shells. The color is uniform pale luteous, and the transverse grooves are very faintly striated parallel to the axis of the shell.

63. **Mitra Ticaonica** Reeve, l. c., pl. xxiii., fig. 181.

This rare South Sea *Mitra* only occurred to our notice in the Viti and Society Islands, where we found several examples under coral blocks on the outer reefs.

64. **Mitra telescopium** Reeve, l. c., pl. xx., fig. 80.

Two imperfect specimens collected on the fringing reef at Kioa, Viti Islands.

They coincide well with Mr. Reeve's figure, except in having the spire less produced and of a smaller size. One example is colored exactly like the above mentioned figure, but the two yellow bands which he does not allude to in his description are paler than in his figure. The other specimen has the spire and the upper third of the body whorl pale flesh color.

65. **Mitra Tahitensis** sp. nov.

Shell elongate-ovate, solid, dark brown with paler shades; whorls 8, flatly convex, minutely crenulated at the suture, closely cancellated with longitudinal and spiral impressed striæ, which are most conspicuous on the upper whorls; aperture less than half the length of the shell, pale brown;

outer lip much thickened, crenulated on the inner margin and slightly sinuate above; columella with five plaits.

Length 37 mill. (Mus. Godeffroy).

Hab. Society Islands.

A single very perfect example was found at Tahiti. It belongs to the same group as *M. adusta* and *fusca*.

66. **Mitra ustulata** Reeve. Conch. Icon., pl. xiii., fig. 89.

A single imperfect specimen found at Kioa, Viti Islands.

Though only two-thirds the size of Reeve's figure, it accords in every other respect.

67. **Mitra versicolor** Martyn. Reeve, l. c., pl. i., fig. 2.

A rare species inhabiting sheltered ground inside the reefs at Tonga and Viti Islands.

Our specimens are a little smaller than Reeve's figure and the mottlings are more delicate and less conspicuous.

Martyn's specimens were also collected at the Friendly Islands, = Tonga.

68. **Mitra** sp.

We found three imperfect examples of this rather large *Mitra* on the fringing reefs at Kioa, Viti Islands.

It is quite distinct from any of the species figured in Mr. Reeve's monograph. The specimens, together with the three following species, are deposited in the Museum Godeffroy, Hamburg.

69. **Mitra** sp.

Four examples obtained at Upolo, Samoa Islands.

70. **Mitra** sp.

Three imperfect specimens were collected on the Kioa fringing reefs, Viti Islands.

71. **Mitra** sp.

A single specimen obtained at Samoa.

Genus STRIGATELLA Swainson.

72. *Strigatella acuminata* Swainson. Reeve, Conch. Icon., pl. xx., fig. 158.

Excepting the Marquesas, we obtained a few examples of this species at all the South Sea groups. They occurred under dead coral on the outer reefs.

Some specimens exhibit three faint, transverse bands on the body whorl, which are a shade darker than the ground color. The spire, which has slightly concave outlines, is usually striated with delicate spiral grooves, which are sometimes continued on the body whorl.

Animal uniform luteous yellow.

73. *Strigatella auriculoides* Reeve, l. c., pl. xxviii., fig. 228.

This somewhat rare species is diffused throughout Polynesia, and is found under dead coral on the outer reefs.

Reeve's figure and description accords tolerably well with the five perfect specimens before me, which are not so robust as represented by the above author. The ground color varies from brown to deep brown-black, with a narrow, transverse, more or less interrupted whitish band on the upper half of the body whorl, which latter is also dotted with the same color. The aperture is bluish-white. The whole surface of the shell is encircled with fine punctated incised lines, which are sometimes obsolete on the middle of the body. Outer lip crenulate on the inner margin.

Our largest example, from the Cook's group, is larger than Reeve's figure, and measures 27 mill. in length by 13 in diameter. Weathered shells when deprived of their epidermis are reddish-chestnut with white markings.

Chenu's figure of *Columbella unifascialis* appears to be the same as Reeve's *Mitra auriculoides*.

The animal is deep chocolate-brown. The creeping disk the tentacles and siphon pure white.

74. *Strigatella brunnea* Pease. Amer. Jour. Conch., 1867, p. 215, pl., xv., fig. 7.

Excepting the Marquesas, Tonga and Viti Islands, this rare species occurs at all the other groups, and like the preceding lives under dead coral on the outer reefs.

Perfect fresh shells are dark ashy-brown, olive-brown or chestnut-brown with a bluish-white aperture, and the edge of the outer lip is dotted with light brown.

Animal milk-white.

75. *Strigatella columbellæformis* Kiener. Reeve, Conch. Icon., pl. xviii., fig. 138.

This fine large *Strigatella* which is somewhat rare, occurs beneath large coral blocks on the outer reefs, and was obtained at the Kingsmill, Society, Cook's and Palmyra Islands. In the 'Catalogue Museum Godeffroy' it is recorded from Samoa group. Reeve and other authors cite Madagascar as its habitat. y

Our shells vary from uniform dark brown to olive-brown, more or less varied with white under a thin olive-yellow epidermis. The transverse impressed lines mentioned by Reeve are minutely punctured.

The animal is rich chestnut-brown with a diluted-white creeping disk. Head slightly varied with white.

76. *Strigatella litterata* Lamarck. Reeve, l. c., pl. xx., fig. 153.

More or less plentiful in all parts of Polynesia except the Marquesas, where we failed to obtain examples. They are found lurking under dead coral in holes and crevices on the outer reefs.

They are subject to considerable variation in size and character of the markings. Reeve's figure is very accurate.

77. *Strigatella maculosa* Reeve, l. c., pl. xxii., fig. 175; pl. xxv., fig. 194.

This species has the same range and station as the preceding, and is nearly as plentiful.

The only difference between this species and *litterata* is, the latter is more distinctly strigated, larger, and the former has the upper half of the shell pale brownish-buff. Panmotu examples are typical, and are accurately represented in Reeve's second figure. Society Island specimens are larger and more nearly allied to *litterata*, but may be distinguished by the brownish-buff color which marks the upper half of the shell.

78. *Strigatella paupercula* Linnæus. Reeve, l. c., pl. xii. fig. 84.

Distributed throughout all parts of Western Polynesia, and usually found lurking under lumps of dead coral, and in crevices on both the outer and inner reefs. At the Kingsmill Islands I gathered several hundred specimens which were larger and finer than obtained elsewhere.

This species is smooth, with a few basal grooves, and the upper whorls near the apex are spirally striated with delicate incised lines. The thin, subpellucid epidermis gives a yellowish tint to the white stripes, as represented in Reeve's very accurate figure.

79. *Strigatella virgata* Reeve, l. c., pl. xxv. fig. 197*b*.

This species, which is less abundant, has the same range and station as the preceding.

As stated in my remarks on *Mitra retusa*, Mr. Reeve has figured that shell (fig. 197*a*.) to represent, in part, his *virgata*, and his description, which is drawn from the two species, should have the following character erased:—"Last whorl encircled round the upper part with a small narrow pale zone," which accords with *retusa* but not with *virgata*.

The species now under consideration, is, without doubt, the same as the above author's figure, 197*b*, which resembles very nearly the South Sea shells. The color and markings are the same as *S. paupercula*, but may be distinguished from that species by its more abbreviate form, more contracted aperture, outer lip more heavily calloused in the inner margin, and the conspicuous spiral grooves. The latter are generally obsolete on the middle of the body whorl, and are frequently punctured. The interspaces between the grooves are either convex or convexly-angulate. Many examples have the body whorl more or less distinctly fluted, a character never observed in *paupercula*, with which it is by some authors united. It is, in my opinion, as closely connected with *litterata* as with the above species.

Dr. Gould, in his "Expedition," cites one of the Païmotu Islands as its habitat, where I very much doubt its being found.

80. **Strigatella zebra** sp. nov.

Shell ovate, solid, smooth, spire short, retuse, base much contracted, obliquely grooved anteriorly, rarely with spiral impressed lines on the upper whorls; dark brownish-black, longitudinally striped with white, the stripes narrow, more or less flexuous, sometimes interrupted; epidermis thin, pale yellowish-brown; whorls 5—6, the last one shouldered and very turgid near the upper portion of the aperture; outer lip with a heavy deposit of callus, slightly crenulate near the base, slightly contracted above.

Found in the Viti and Samoa Islands.

Genus *TURRICULA* Klein.

81. **Turricula amabilis** Reeve. Conch. Icon., pl. xxxiii., fig.

274.

This small species which is rather rare, was obtained at

all the groups except the Sandwich, Marquesas and Caroline Islands. They were found under dead coral on the fringing reefs.

Some of our examples differ slightly from Reeve's description in having the shell alternately banded with white and luteous. The grooves are darker than the ground color of the shell.

In Paetel's catalogue it is recorded from the Sandwich Islands.

82. **Turricula aurantia** Swainson.

Tiara aurantia Swain., (Broderip), Proc. Zool. Soc., 1835. *Mitra pyramidalis* Reeve, l. c., pl. xxvi., fig. 208.

A very rare species of which we found two examples washed up on the lagoon shore at Anaa, Panmotu Islands, the same locality where Swainson's type specimens were obtained.

The genus *Turricula* being now most generally accepted, Swainson's name should be restored, as Gmelin's *aurantia* is embraced in the genus *Mitra* as restricted.

The two examples before me are smaller than Reeve's figure, and the sculpture agrees precisely with his description, and one is exactly the same color as mentioned by him, viz. : orange-yellow, with a white band. The other is white, with two transverse orange-yellow bands on the body whorl.

83. **Turricula amanda** Reeve, l. c., pl. xxxviii., fig. 318.

Occurred in the condition of dead shells on the fringing reefs at Kioa, Viti Islands, where it appears to be not uncommon, and probably inhabits sandy bottoms in deep water. Dr. Græffe obtained examples at Samoa.

Mr. Reeve's slightly enlarged figure, which very accurately represents the species as regards shape and sculpture, is incorrectly colored. He describes the shell as being

white, banded with reddish-brown. Our examples, which are, no doubt, somewhat faded, are the same color, and the bands are always three, as represented in the figure. Living shells are probably banded with dark brown or brownish-black.

84. *Turricula assimilis* Garrett, Proc. Zool. Soc., 1872, p. 481.

A very rare species found under dead coral on the outer reefs at the Cook's, Samoa, and Viti Islands.

An oblong, subfusiform, shining species of a whitish colour, with closely-set slightly-raised deep brown lines.

85. *Turricula angulosa* Martini (?) Reeve, Conch. Icon., pl. xxviii., fig. 223*a*, 223*b*.

I obtained many fine living specimens of this species by digging in sandy mud, at low water mark in sheltered places, at Vanua Levu, Viti Islands.

Not being quite satisfied with the above determination, I have marked it with a doubt.

Our shells are a little smaller than Reeve's fig. 223*a*, which they much more nearly resemble than the larger figure, 223*b*, which has the appearance of a distinct species. He describes the colors as "*light brown, stained here and there with brown spots.*" Viti examples are ashy-slate, and all have a more or less distinct pale band just beneath the sutural angle. The aperture is brownish, with a white zone, and some have the throat bluish-white. The columella is brown, with four or five pale plaits.

The sculpture, which is very uniform and beautiful, consists of about 20 narrow longitudinal ribs, which are decussated with about the same sized but more crowded spiral flattened ridges, which form crenulations at their points of intersection and gives the whole surface a regular foveolate appearance.

The spiral ridge on the angulate shoulder is a little larger than the others and forms a row of larger granules, but not pointed as stated by Reeve. The spiral row of foveæ immediately above the angle is also twice the size of the others, forming shallow square pits with two contiguous ridges next to the suture.

86. **Turricula bilineata** Reeve, l. c., pl. xxxv., fig. 294.

A very rare species of which we obtained two dead specimens on the fringing reefs at Kioa, Viti Islands.

Mr. Reeve's figure and description accords so nearly with our shells that I do not hesitate to consider them the same, though having one columellar plait less than mentioned in his description. His figure shows four plaits the same as our shells. The two spiral lines on a polished blackish-brown ground will readily distinguish the species.

87. **Turricula bella** Pease. Proc. Zool. Soc., 1860, p. 145.

This somewhat scarce species appears to be peculiar to the Sandwich Islands, where they live on sandy bottoms in the upper region of the laminarian zone.

88. **Turricula bicolor** sp. nov.

Shell small, fusiform, slightly shining, cinereous, with two transverse rose colored bands on the body whorl, the upper one traversing the whorls of the spire; spire with slightly concave outlines; whorls embryonal 3, smooth, irregularly increasing, normal whorls 6-7, nearly flat, somewhat shouldered, the last one convex, depressed on the right side, base strongly contracted, granulated and produced into a short recurved canal; surface longitudinally ribbed, ribs smooth, angular, 12-13 on the body whorl, interspaces with fine transverse grooves; aperture narrow, little more than half the length of the shell; peristome moderately thick and distinctly sinuous above; columella with four plaits.

Length 8 mill. (Mus. Godeffroy).

Hab. Samoa and Panmotu Islands.

A somewhat rare and beautiful species found beneath dead coral on the outer reefs. It belongs to the same group or section as *T. exquisita* and differs from that species in its larger size, fewer ribs, more distant transverse grooves and wants the sharp spiral brown lines.

89. **Turricula Cumingii** Reeve. Conch. Icon., pl. x., fig. 67.

This is one of the rarest and most beautiful of the South Sea *Mitres*. We were fortunate in taking a large and very perfect example on the outer reef at Makimo, one of the Panmotu Islands; also a single and very much worn specimen was picked up on the beach at Upolo, Samoa Islands.

Mr. Reeve's poor figure gives no idea of the beauty of this shell. Our Panmotu example, which is larger than the above-mentioned figure, is a rich shining orange-red, mottled with pure white, and the transverse grooves on the orange-red ground are lined with chocolate-brown. The aperture is the same, but darker than the ground color. The whorls are crenulated next to the suture, and the grooves gradually become obsolete towards the apex.

90. **Turricula cadaverosa** Reeve, l. c., pl. xxi., fig. 160.

Very abundant, buried in sand in the upper region of the laminarian zone, inside the reefs at the Society, rare at the Panmotu, Samoa and Viti Islands.

Mr. Reeve, on the authority of Cuming, frequently gives the station of the sand *Mitres* "*under stones*," where they are *never* found except when dragged there by hermit crabs.

Reeve's figure of this species, which very correctly represents the sculpture, is too robust to accord with the usual form. They are subject to considerable variation in the size and number of the ribs, and in the distinctness of the two angles on the body whorl, as well as in the size of the

tubercles. When they depart so widely from the type, they can scarcely be distinguished from *T. Pacifica*, Reeve. The band is occasionally obsolete, and is usually more or less interrupted.

91. **Turricula concinna** Reeve, l. c., pl. xxvi., fig. 203.

A few more or less perfect dead shells were found on the reefs at Samoa and Viti Islands.

Our examples, which are somewhat faded, accord very nearly with Reeve's figure and description of a Philippine specimen. The Polynesian shells vary from yellow to orange-yellow with the interspaces between the transverse ridges brownish-red, and the third ridge beneath the angle is white as represented in the above mentioned figure but not alluded to in the text. Some examples have the angle on the upper portion of the whorls nearly obsolete.

92. **Turricula crocata** Lamarck. Reeve, l. c., pl. xxvi., fig. 206.

Like the preceding species dead specimens only, occurred on the reefs at all the groups south of the equator, except the Marquesas and Panmotu Islands.

Our examples are light orange-yellow, and like the preceding species which they closely resemble in shape and sculpture, have a similar transverse white band on the third ridge beneath the angle. The ridges are more distinctly granulated than on *concinna*, which with the concolored interspaces will at once distinguish it from the latter.

93. **Turricula consanguinea** Reeve, l. c., pl. xxx., fig. 241.

More abundant than the two preceding species, and occurs at all the groups except the Caroline and Marquesas Islands. Found under dead coral on the outer and inner reefs.

Our shells which are darker than Reeve's figure, are deep brownish-red, and all have a transverse row of whitish

spots on the middle of the body whorl, and smaller ones may be observed on the base and spire. The outer lip and columella are also more or less stained with brownish-red. They vary considerably in the length of the spire, which is generally shorter than in Reeve's figure, and one large example before me has it a trifle more produced. The spiral striæ are minutely punctured.

It is frequently confounded with *T. dermestina*, with which it is very closely allied.

94. **Turricula crebrilirata** Reeve, l. c., pl. xiii., fig. 92.

I found several dead specimens on the fringing reefs at Kioa, Viti Islands.

Though only two-thirds the size of Mr. Reeve's figure of a Ceylon example, they agree so exactly with his description, except in color, that I do not hesitate to consider them the same. Our shells are dark ashy-brown, and all have the pale line on the upper portion of the body-whorl.

95. **Turricula concentrica** Reeve, l. c., pl. xvii., fig. 128.

I obtained many living specimens of this species by digging in sand in the upper region of the laminarian zone, in a sheltered place at Kioa, Viti Islands. Though carefully searched for, I failed to get a single example in any other part of the group. Reeve states that Mr. Cuming found it on the reefs at Anaa, Panmotu Islands.

Our shells are smaller, more slender, and the wide basal band is paler than represented in Reeve's figure.

The ground color is a pale flesh tint, and the band varies from tawny-flesh to light brown.

96. **Turricula cruentata** Chemnitz. Reeve, l. c., pl. xvii., fig. 126.

We gathered a few living specimens of this species in a sheltered bay on the east end of Vanua Levu, Viti Islands. They were found adhering to stones and driftwood in shallow

water on a sandy-mud flat.

They agree closely with Reeve's description, but his figure, which is a little larger than our shells, is very poor.

The color is ashy-brown, encircled with a whitish band, and the ribs vary from light yellowish-brown to brownish-orange. The conspicuous transverse incised lines, though generally continuous, are sometimes interrupted by the ribs.

97. *Turricula cimelium* Reeve, l. c., pl. xxxii., fig. 260.

T. (Pusia) nodulosa Pease. Amer. Jour. Conch., 1867, p. 214, pl. xxv., fig. 5.

A few specimens found on sandy beaches at the Panmotu and Society Islands.

Mr. Reeve's very accurate figure and description coincides exactly with our specimens, except in not mentioning the fine, crowded, transverse, impressed lines or striæ. His figure represents the transverse, interrupted brown lines very correctly. They are confined to the right slope of the longitudinal ribs, and do not extend quite to the nodules on the shoulder of the body whorl.

All the specimens I sent to Mr. Pease were too much worn to be of any use in identification or description.

98. *Turricula crisa* Garrett. Proc. Cal. Acad. Sciences, 1871, p. 201.

A few specimens taken in sandy-mud a little below low-water mark, inside the reefs at Upolu, Samoa Islands. A single large dead example occurred in the Viti group.

The livid color, angular whorls, crisp-like and foveolate surface, and the violaceous columella are its most essential characters.

99. *Turricula castanea*, sp. nov.

Shell oblong, rather thick, turreted, shining, longitudinally plicately-ribbed, ribs somewhat angular, closely set; interspaces concave and marked by transverse impressed

striæ ; whorls 8, flatly convex, last one contracted and slightly granulated at the base ; aperture bluish-white, a trifle less than one-half the length of the shell ; columella with four plaits ; colour dingy-brown, with a single pale revolving line.

Length 18 mill. (Mus. Godeffroy.)

Hab. Samoa and Viti Islands.

Three dead examples found on the fringing reefs at the above groups.

100. **Turricula diachroa (Mitra)** Adams and Reeve. Voy. Samar., pl. x., fig. 29.—*Mitra Graffi*, Crosse, Jour. de Conch., 1867, p. 297, pl. xi., fig. 6.

Not uncommon under clumps of dead coral in the lower region of the littoral zone, inside the reefs at Samoa, and more rare in the Viti and Tonga Islands. They are usually found associated with *Engina mendicaria* which they resemble so closely in shape and color as to be easily mistaken for small specimens of the latter species.

M. Crosse's figure, which is slightly enlarged, very correctly represents the usual form. They, however, frequently differ in being more slender, and the ribs are sometimes nearly obsolete. The bands which are generally three on the body whorl, the upper one following the course of the spire, are flesh-white under a thin luteous epidermis on a jet-black ground. The aperture and triplicate columella are tinted with purple-brown.

Animal black. The foot is oblong, margined with yellow, slightly auriculate in front, and about three-fourths the length of the shell. Siphon rather long, irrorated with white. The pale tentacles are marked by two black zones.

- 101 **Turricula discoloria** Reeve. Conch. Icon., pl. xxix., fig. 230.

We obtained several more or less perfect specimens of

this species on the shore reefs at Kioa, Viti Islands.

Our examples agree in every particular with Reeve's description and figure, except in the absence of the pink bands, which are not represented in the latter, though alluded to in the text. The "burnt black" spots between the ribs, which are faithfully represented in his figure, appear to be constant. The bands are whitish, under a very thin luteous epidermis, which is generally more or less worn off in the most perfect examples. Between the spots the ribs are of a burnt-umber color, as represented in Reeve's figure. The basal granules are whitish on a burnt-black ground. The locality was unknown to Mr. Reeve. Paetel records it from the Philippine Islands.

102. *Turricula exasperata* Chemnitz. Reeve, l.c., p. xxi., fig. 162.—*Mitrea arenosa*, Lamarck. Reeve, l. c., p. xxi., fig. 161.

This elegantly sculptured species appears to be confined to Western Polynesia, where they occur at all the groups. We gathered thousands of living examples at the Tonga and Viti Islands by digging in clear sand and sandy mud at low water.

Mr. Reeve gives the station "under stones" where they *never* occur except when dragged there by hermit crabs. All the *Mitres* of this type bury themselves in sand and only come to the surface during the night.

Reeve's accurate figure, which represents a Philippine example, is a little larger than our shells and may be considered the typical form.

The whole surface is covered with small granules formed by the longitudinal and transverse incised lines. The ribs vary considerably both in size and number, and sometimes are nearly obsolete. The angle on the shoulder is also subject to variation and is occasionally very indistinct. The

color is white or cinereous, and sometimes nearly uniform blackish-brown. The ribs are frequently lineated with light brown or blackish-brown, the lines often interrupted so as to form two transverse rows of linear spots which gradually merge into the conspicuously banded variety which represents Lamarck's *arenosa*.

103. *Turricula exquisita* Garrett. Proc. Zool. Soc., 1872, p. 842.

This lovely little shell inhabits the Viti, Samoa, Cook's, Society and Panmotu Islands. The few living examples which came under my observation were obtained from beneath large blocks of dead coral, on the outer reefs.

Its small size (5 mill.), slender fusiform shape, shining pinky-red color with two transverse brown lines inclosing a white band, numerous plicate ribs and transverse impressed lines will readily distinguish it.

104. *Turricula Emilieæ* Schmeltz. Cat. Mus. Godeffroy, No. 5, p. 119.

T. (Costellaria) plicatula Pease. Amer. Jour. Conch., 1867, pl. xv., fig. 4.

A few more or less perfect dead specimens were found in beach sand at Anaa, Panmotu Islands.

Mr. Pease's name being preoccupied for a fossil species, it has been changed as above.

It is a small, oblong-ovate shining species of a reddish-chestnut or light brown, with three yellowish or pale brown transverse bands on the body whorl.

105. *Turricula flammulata* (Mitra) Pease. Amer. Jour. Conch., 1867, p. 212.

Mitra zebrina Garr. Proc. Zool. Soc., 1872, p. 842.

A very rare species ranging from the Panmotu to the Viti Islands. Mr. Pease records it from the Sandwich Islands. All my examples were found in a more or less

perfect though dead condition on the outer reefs.

The smooth shining surface, numerous narrow longitudinal flexuous brown stripes on a bluish-white ground are its most obvious characters.

106. *Turricula flexicostata*, sp. nov.

Shell acuminate turreted, rather slender, ashy-brown, with a single narrow pale zone on the upper portion of the body whorl, which is continued upward on the middle of the whorls of the spire; whorls 9, convex, longitudinally plicately ribbed, ribs narrow, smooth, flexuous; interstices with rather close, transverse incised lines; base contracted, slightly produced and somewhat twisted; aperture less than half the length of the shell, brownish with a whitish zone; columella with four plaits.

Length 15; diam. 5 mill. (Coll. Garrett).

Hab. Panmotu and Viti Islands.

A few more or less perfect dead specimens found on sandy beaches.

As compared with *obeliscus*, the nearest allied species, it is much smaller, differently colored, the ribs smoother, more flexuous and the narrow pale zone is nearer to the suture on the body whorl and more distant on the spire.

107. *Turricula festiva*, sp. nov.

Turricula formosa Garr. M.S. (not of Pease).

Shell acuminate turreted, somewhat fusiform, cinereous, slightly mottled with ashy-brown; whorls 8, flatly convex, angulate beneath the suture, longitudinally plicately ribbed, ribs narrow, rather closely-set, rather nodose on the angle; interstices transversely striated with impressed punctured lines; aperture elongate; columella with five plaits.

Length 13 mill. (Mus. Godeffroy).

Hab. Viti Islands.

During two years' collecting in the above group I found

two examples only (living), which were dug out of sandy-mud near low water mark in Sawa Sawa Bay. The general aspect of the shell is somewhat like *T. Michauui* Crosse & Fischer, but differs in color and details of sculpturing.

108. ***Turricula fusco-nigra***, sp. nov.

T. nigricans Garr. M.S.

Shell acuminate turreted, slender, somewhat fusiform, base contracted, slightly produced into a slightly twisted canal; dark brownish-black, with a whitish spiral line above; whorls 10, flatly convex, somewhat roundly shouldered, longitudinally ribbed, ribs small, rounded, narrower than their interspaces, about 14 on each whorl; interstices with large crowded transverse grooves; aperture less than half the length of the shell, black or livid within; columella with four plaits.

Length 18 mill. (Mus. Godeffroy).

Three dead examples found on the Kioa shore reefs, Viti Islands.

109. ***Turricula fortiplicata*** Pease. Amer. Jour. Conch., 1867, p. 213, pl. xv., fig. 3.

Several examples found in beach sand at Anaa, Pohnotu Islands.

A small species with stout plicate ribs, impressed striæ in the interspaces, and of a light chestnut color with the base and apex whitish.

110. ***Turricula Gruneri*** Reeve. Conch. Icon., pl. xvi., fig. 119.

A single example was picked up on the sands at Upolu, Samoa Islands. It is also recorded from the Pelew group.

111. ***Turricula Hoyti*** sp. nov.

Shell oblong, fusiform, rather solid, shining, whitish, mottled and striped with chestnut brown; spire moderate, with flattened outlines; whorls 8, planulate, slightly shouldered, last one large, convex, strongly constricted at the base,

longitudinally ribbed ; ribs small, rather distant, somewhat angular, indistinctly constructed beneath the suture ; interstices with rather crowded, transverse impressed lines ; aperture nearly half the length of the shell ; columella with four plaits.

Length 14 mill. (Mus. Godeffroy).

Hab. Viti Islands.

A single specimen found on the sands at Kioa Island.

112. *Turricula instricta* sp. nov.

Shell small, oblong, fusiform, slightly shining, cinereous, with a dark line just beneath the suture, and the aperture with a brown band ; spire moderate with slightly convex outlines ; whorls 7 (?) ; (apex fractured), convex, last one very slender towards the base, which is produced into a recurved canal ; surface longitudinally ribbed, ribs rather small, angular, about 14 in the penultimate whorl, constricted just beneath the suture, forming a row of nodules ; interstices transversely impressly striated ; base granulated ; aperture narrow, nearly half the length of the shell ; peristome rather sharp, with a distinct sinus above ; columella with 4 plaits.

Length 8 mill. (Mus. Godeffroy).

Hab. Viti Islands.

A single specimen found on the shore reef at Kioa Island.

113. *Turricula lyrata* Lamarck. Reeve, Conch. Icon., pl. vii., fig. 46.

This beautiful species which only occurred to our notice at the Samoa and Viti Islands, is not by any means common. All our living examples were found buried in muddy-sand in the upper region of the laminarian zone.

Our examples are more of an olive-gray tint than "ashy-blue" as stated by Reeve, and the narrow brown bands are constant. The aperture is bluish-white, the outer lip and

columella varied with brown.

114. **Turricula luteo-fusca (Mitra)** Garrett. Proc. Zool. Soc., 1872, p. 842.

Two dead specimens occurred on the Raratonga reef, Cook's Islands.

A small shining species of a yellowish-brown color, varied with large whitish spots.

115. **Turricula luculenta** Reeve. Conch. Icon., pl. 30., fig. 245.

A rather scarce species of which I found several examples lurking under dead coral on reefs at Samoa, Tonga and Viti Islands.

Our specimens, which are the same size as Reeve's figure of a Philippine shell, are alternately banded with luteous and chocolate-brown.

116. **Turricula leucodesma** Reeve, l. c., pl. xxx., fig. 243.

Three examples found adhering to dead coral on a sandy-mud flat on the eastern part of Vanua Levu, Viti Islands.

Our shells agree well with Mr. Reeve's description and tolerably well with his poor figure. The color is nearly jet-black, encircled by a chain of large white spots.

Mr. Brazier records it from Torres Straits.

117. **Turricula lauta** Reeve, l. c., pl. xxx., fig. 244.

Excepting the Marquesas, this rather rare species occurred to our notice at all the groups where they were found under dead coral on reefs.

The color varies from dark brownish-red to nearly black with orange-yellow ribs. Sometimes the middle of the body whorl is encircled by a row of spots which are a little paler than the ribs. The pale aperture is not spotted with brown or dark red as in *dermestina* and *consanguinea*.

The interspaces between the smooth ribs are finely and closely striated with transverse incised lines which under the lens are closely punctured.

It is very closely allied to the above two species.

118. *Turricula laevicostata* sp. nov.

Shell small, elongate, fusiform, shining, white, more or less stained with straw-yellow; spire rather long, acute; whorls 8, planulate, last one narrow, convex, contracted and recurved at the base; longitudinally costate, costæ small, smooth, rounded, interstices with transverse impressed striæ; aperture narrow, with very prominent liræ; outer lip rather thick, and slightly sinuous above; columella with five plaits.

Length 10 mill. (Mus. Godeffroy).

Hab. Panmotu Islands.

Two examples found on the sands at Anaa Island.

119. *Turricula microzonias* Lamarck. Reeve, Conch. Icon., pl. xxiv., fig. 185, pl. xxvi., fig. 202.

Notwithstanding the wide range of this species, it is, indeed, a very scarce shell. It occurs in all parts of Western Polynesia, and in the Eastern groups we obtained it at the Society and Panmotu Islands.

The only two living examples found were taken from the under side of stones on the shore reef at Kioa, Viti Island.

Of Reeve's two poor figures the second one is the most correct. Both Lamarck's and the above author's description refer to faded examples.

When perfect, the color is jet-black. The white zone, which is constant, usually consists of a chain of small white spots, but is sometimes expressed by a simple continuous line. Some examples have a second line beneath the middle zone. The aperture is bluish-white, margined with brown-black. The columellar plicæ are bluish-white on a more or less dark brown ground.

The ribs are sometimes nearly or quite obsolete on the back of the body whorl. Mr. Reeve does not allude to the peculiar plicately wrinkled base, which latter is

also obliquely ridged.

120. *Turricula mucronata* Swainson. Reeve, l. c., pl. 17, fig. 125.

This species, which appears to be rather scarce, was found buried in sand inside the reefs, in shallow water, at the Society and Paumotu Islands.

It is shaped very much like *T. concentrica*, and has a similar wide basal band, but may be readily distinguished by the double row of sharp tubercles and granulated base.

The animal has the upper surface of the foot a rich reddish-brown, irregularly dotted with yellow, and the creeping disk cinereous. Siphon dusky with yellow dots.

121. *Turricula millecostata* Swainson. Reeve, l. c., pl. xxxvi., fig. 301.

Of this very rare species we have found only four dead examples on the outer beach at Anaa, Paumotu Islands, the same locality of Swainson's type specimens.

The color appears to be somewhat variable: one specimen is dark chestnut with a white apex, as mentioned by Reeve, and two are orange-yellow, with two broad interrupted ferruginous bands. The other is reddish-chestnut, faintly mottled with orange-yellow, with two remote transverse lines of the latter color. The transverse impressed striæ extends over the whole surface, and the base is conspicuously granulated.

Mr. Reeve's figure correctly represents the shape, but the color is different from any specimens known to me, and does not accord with the text.

122. *Turricula modesta* Reeve, l. c., pl. xxxi., fig. 254.

Several dead specimens found on sandy flats at Samoa and Viti Islands.

Our examples, though of smaller size than represented by Reeve, agree in every particular with his description and

very accurate figure.

123. *Turricula multicostata* Swainson. Reeve, l. c., pl. xxxviii., fig. 322.

A rare and beautiful species, inhabiting all the groups South of the Equator, except the Marquesas and Tonga Islands. On the outer reefs, and found only in the condition of dead shells.

The narrow white zone mentioned by Reeve is sometimes nearly obsolete or reduced to a thread-like line. The base is distinctly granulated, and the whole surface exhibits distant incised lines between the ribs.

124. *Turricula Michauii* (Mitra) Crosse et Fischer. Jour. Conch., 1864, p. 337.—*Mitra rigida*, Reeve, not of Swainson, Conch. Icon., pl. xxii., fig. 169.—*Turricula* (*Costellaria*) *Dunkeri*, Schmeltz, Cat. Mus. Godeff., iv., p. 84; *T. (C.) Deshayesii*, Schmeltz, (Reeve?) l. c., v, page 119.

We obtained hundreds of living examples of this elegant species by digging in sand near low water mark in sheltered places at the Tonga and Viti Islands.

Our specimens, which are the same size as Reeve's figure have three rows of brownish-orange spots on the body whorl, the upper one continued up the spire. The ground color is white or bluish-white, and the aperture is marked with two transverse brownish patches in the throat. All have the interspaces between the ribs more or less distinctly striated with transverse incised lines.

Not having access to Swainson's Zoological Illustrations, I am unable to form an opinion with respect to Reeve's determination of this species, of which he gives a good figure, which only differs from our examples in having one more row of spots on the whorls of the spire. He gives no locality.

Messrs. Crosse and Fischer who had an opportunity of examining Cochin China specimens, state that Reeve's *rigida*

is not Swainson's species. Presuming their conclusions to be correct I have adopted their specific name. They mention four rows of spots on the body and two on the spire.

It has been referred to Reeve's *Deshayesii*, which is described and figured as simply noduled on the angle, smooth beneath, and no ribs mentioned.

125. **Turricula modicella**, sp. nov.

Shell small, fusiform, glossy, white, with the upper portion of the whorls and base tinged with brown; spire rather long, with concave outlines; base strongly contracted and produced into a short, slightly twisted canal; whorls embryonal two, smooth, normal whorls six, flatly convex, somewhat roundly shouldered, last one slightly turgid; longitudinally ribbed, ribs smooth, angular, about 13 on the body whorl; interstices transversely impressly striated; aperture narrow, less than half the length of the shell; outer lip with a slight sinus above; columella with three plaits.

Length 7 mill. (Mus. Godeffroy).

Hab. Pāpāmōtu Islands.

A rare and pretty species of which we found several examples under coral on the outer reefs.

126. **Turricula nodosa** Swainson. Reeve, Conch. Icon., pl. xxv., fig. 196a, 196b.

Excepting the Marquesas, this species was obtained at all the South Sea groups, where they are found on the inner margins of reefs.

They vary, some in the size of the tubercles and in the distinctness and number of incised lines. At some of the Pāpāmōtu Islands, where they are more abundant than elsewhere, a small variety occurs which has a row of pale slate-colored spots on the middle of the body whorl, the spots confined between the ribs. Some have a slate-colored band articulated with orange-yellow.

127. *Turricula obeliscus* Reeve, l. c., pl. xv., fig. 107.

Several dead examples of this rare species were found on a sandy mud flat at Kioa, Viti Islands.

All our specimens exhibit the same style of sculpture as mentioned by Reeve, and are shaped exactly like his figure. The most perfect examples are of a yellowish-brown color, rather paler on the ribs, and all are encircled with the white line mentioned by the above author. Three specimens which are somewhat weathered appear to have been of a deeper brown than the typical color.

The interspaces between the ribs are marked by rather large closely-set transverse grooves. The largest example which is the same size as Reeve's figure has 12 convex whorls divided by a rather deep suture.

128. *Turricula purpurata* Reeve, l. c., pl. xxxiii., fig. 275.

A few specimens of this pretty species were found on the outer sandy beaches at Anaa, Papumotu Islands.

Our examples which are more or less rubbed agree closely with Reeve's description and figure, except in being of a light pink color with traces of a white zone, and some seem to have had spots or streaks of the same color on the ribs. The description reads "*interstices impressly cancellated*," which term appears to signify that the impressed lines are interrupted by the ribs and not continuous as in our specimens.

Notwithstanding the above discrepancy I do not hesitate to consider our shells identical with the Philippine species.

129. *Turricula patriarchalis* Gmelin. Reeve, l. c., pl. xix., fig. 146a, 146b.

A few dead specimens of this handsome species were found washed up on beaches at the Samoa and Viti Islands.

They differ considerably in the development of the nodules on the shoulder, and the broad band varies from

dark red to deep brown-black. Our largest specimens are the same size as Mr. Reeve's figures of Philippine shells. I obtained some fine examples at the small group of Aiou Islands near Waigion in the eastern part of the Moluccas.

130. *Turricula Pacifica* Reeve, l. c., pl. xxxiii, fig. 272.

Not uncommon, buried in sand in shallow water, inside the reefs at the Panmotu, Society, Samoa, Viti, and Kingsmill Islands. u

The brown band, which is seldom continuous, usually consists of a row of small spots, which are frequently nearly or quite obsolete. The longitudinal ribs vary much in size and number, and some of the forms gradually pass into *T. cadaverosa*, with which it is more nearly allied than with *exasperata*, as stated by Reeve.

131. *Turricula plicata* Klein. Reeve, l. c., pl. viii, fig. 56.

A single perfect adult and a young example was found buried in sand at the Caroline Islands.

The adult specimen, which is one-fourth smaller than Mr. Reeve's figure, is not nearly so gaudily colored, but agrees precisely in coloration as mentioned in his description. He does not allude to the transverse impressed lines, which are very distinct.

132. *Turricula porphyretica* Reeve, (?) l. c., pl. xxv, fig. 195.—*T. ventricosa*, Garr. MS.

A very rare species, of which we obtained two examples on the outer reefs at the Samoa and Viti Islands.

Our two shells, which are a little larger than Reeve's figure of a Philippine example, agree very nearly in shape and sculpture with the above species. The Viti specimens are differently colored, the ribs smaller, more numerous and are distinctly striated with spiral impressed lines; the latter character is neither alluded to in the text or represented in the figure. However, after some hesitation I have adopted

Reeve's name with a doubt, using mine as a synonym, which latter can be retained if it should prove to be new to science.

In order to assist in clearing up the doubt, I subjoin the following description :—

Shell solid, ovate, ventricose, slightly shining, rapidly tapering towards the base, longitudinally plicately ribbed ; ribs rather small, decussated with impressed lines and granulated near the base ; whorls 9-10, planulate, angulately shouldered ; aperture half the length of the shell, bluish-white, varied with brown ; columella four-plaited ; outer lip crenulate ; color dingy-brown, with two pale transverse lines ; upper whorls whitish.

Length 22 mill. (Mus. Godeffroy).

133. **Turricula pulchra**, sp. nov.

Shell acuminate turreted, solid, subfusiform, slightly shining, contracted and obliquely grooved towards the base, which is somewhat twisted ; whorls 9-11, nearly flat, angularly shouldered, longitudinally plicately-costate, costæ smooth, 12 to 14 on the body ; interstices with fine longitudinal striæ and with or without transverse impressed lines ; columella four-plaited ; aperture about two-fifths the length of the shell. Color variable ; whitish, bluish-white, ashy-blue, ashy-green, brown with pale ribs, and generally with four or five transverse fillets of small alternately orange-yellow and brown spots ; some of the dark examples have a whitish spiral line and the articulated fillets are nearly obsolete ; aperture and columella brownish with a pale zone above.

Length 18, diam. $6\frac{1}{2}$ mill. (Coll. Garrett).

Hab. Viti and Samoa Islands.

About 30 fine living examples were obtained by digging in sandy-mud at low water mark at Kioa, Viti Islands, and a few smaller ones at the Samoa group. Specimens from the latter group are only about half the size of the Viti

examples and are equally as variable in color.

It is closely related to *T. Michautii* in shape and sculpture, but quite different in the character of the markings, and the shoulder is more tabulate. The upper termination of the ribs are less nodulous and the color of the columella differs.

134. **Turricula putillus** Pease. Amer. Jour. Conch., 1867, p. 214, pl. xv., fig. 24.

A few specimens found in beach sand at the Panmotu and Society Islands.

Mr. Pease's type specimens, which were obtained from one of the small guano islands in "Central Pacific" are a little larger than our shells.

Rubbed specimens are reddish-brown, and when fresh, black or brown-black with a more or less distinct narrow white zone, and most generally with a few large white spots on the upper half of the shell. The whole surface is regularly granulated.

135. **Turricula Peaseii**, sp. nov.

Shell elongate, fusiform, shining, ashy-grey, transversely lineated with light brown and marked above with a spiral ashy-white line; spire rather long, acute; whorls 9, flatly convex, subangulate above, longitudinally plicately ribbed; interstices concave, transversely striated with impressed lines; base contracted, granulated, produced and slightly twisted to the left; aperture a little more than half the length of the shell, bluish-white stained with brown; columella four plaited.

Length 23 mill. (Mus. Godeffroy).

Hab. Viti Islands.

Only two examples found in sandy-mud at low water mark at Vanua Levu Island. It is shaped very much like *T. lyrata*.

136. *Turricula propinqua*, sp. nov.

Shell elongately fusiform, ashy-white, spire rather long, turreted, longitudinally ribbed; ribs angular, as large as their interspaces, 14 on the last whorl, intersected by small transverse ridges; whorls 9, angulately rounded on the shoulder, where two of the spiral ridges are wider apart than elsewhere and slightly noded; base strongly contracted and produced into a short slightly twisted canal; aperture nearly half the length of the shell; columella with five plaits, the upper one remote and large.

Length 15 mill. (Coll. Garrett).

Hab. Viti Islands.

A single example found in beach sand at Kioa Island. It closely resembles *T. modesta* Reeve, but is more contracted at the base, and the transverse ridges are much smaller and more numerous. It is shaped very much like *T. Pharaonis* H. Ads., which inhabits the Red Sea, but is smaller, differently colored and the ribs are more numerous.

137. *Turricula rosea* Swainson. Reeve, Conch. Icon., pl. xxxvi., fig. 300.

Two dead specimens found in beach sand at Anaa, Pāmotu Islands.

Our two shells differ none from Reeve's description and figure except in having the upper portion of the last and two preceding whorls, white. The transverse row of small brown spots between the ribs, can be seen on our perfect specimen.

Mr. Swainson's type examples were obtained in the same locality as our shells.

138. *Turricula rubra* Swainson. Reeve, l. c., pl. xxxv., fig. 285, pl. xxxvi., fig. 298.

Several specimens found in beach sand at the Pāmotu Islands, where Mr. Cuming obtained Swainson's type examples.

139. *Turricula subulata* Lamarck. Reeve, l. c., pl. xi., fig. 79.

A single dead example was found on a sandy flat on the south coast of Vanua Levu, Viti Islands. Mr. Reeve on the authority of Cuming cites Anaa, Panmotu Islands, as one of its localities.

As compared with Reeve's indifferent figure, which does not represent the longitudinal ribs, it is larger and the spire is not so slender. The numerous small ribs are very regularly disposed and about the same size as their interspaces. The whole surface is marked by equidistant transverse incised lines, which gives the shell a regular cancellated appearance.

The color which undoubtedly is somewhat faded is creamy-yellow with traces of white patches.

140. *Turricula semifasciata* Lamarck. Reeve, l. c., pl. xvii., fig. 131a, 131b.

Numerous living specimens were obtained by digging in sandy localities, a little below low water mark, inside the reefs at Samoa, Tonga and Viti Islands. It is also recorded from the Caroline Islands.

None of our numerous example are so large as Reeve's figure *a*, and only very few equal in size his smaller variety *b*. The color varies from pale flesh white to cinereous, and the bands on the basal portion of the body whorl vary from yellowish-olive to olive brown; all have the three transverse brown lines on the last whorl, which are also articulated with yellowish.

141. *Turricula stigmataria* Lamarck. Reeve, l. c., pl. iii., fig. 15.

This lovely species, which is somewhat rare, only occurred to our notice at Rioa and Vanua Levu, Viti Islands, where we found a few living examples by digging in sandy-mud, at low water mark, in sheltered bays. Some had buried themselves at a depth of two feet. It is also recorded

from Samoa and the Pelew Islands.

Our specimens are one-third smaller than Reeve's figure of Philippine examples, but agree in every other particular.

142. **Turricula speciosa** Reeve, l. c., pl. xix., fig. 148.

This rare and handsome species occurred only in the condition of more or less perfect dead shells. They were found on the outer reefs at the Cook's and Panmotu Islands.

Our shells differ none from Reeve's description and figure of Philippine examples, except in the ribs being somewhat angular and nodulose next the suture; the latter character though faintly expressed in the above mentioned figure is not alluded to in the text.

143. **Turricula tusa** Reeve, l. c., pl. xxxiv., fig. 283.

u/ This interesting little species which is rarely obtained, occurs under dead coral at the Panmotu, Society, Sandwich and Samoa Islands.

They accord in every particular with Reeve's description and figure of a Philippine specimen. The upper third of the body whorl and the spire exhibits large tessellations on a white ground, the spots and lower portion of the body whorl varies from reddish-brown to blackish-brown. A single transverse white band marks the deep brown aperture. The upper portion of the whorls are distinctly concave and the ribs granulated.

The animal is greenish-white, and beautifully marbled with chocolate-brown.

144. **Turricula unilineata**, sp. nov.

Shell acuminate, turreted, subfusiform, rather slender, base contracted and slightly twisted, shining, brownish-lead color with a single spiral whitish line on the upper portion of the body; whorls 10, flatly convex, somewhat roundly shouldered; longitudinally ribbed, ribs not very prominent

nor closely-set, obsolete or nearly so on the last whorl; interstices with distant transverse linear grooves, most conspicuous on the upper whorls; aperture less than half the length of the shell; columella with four plaits.

Length 19 mill. (Mus. Godeffroy).

Hab. Viti Islands.

Appears to be rather scarce; only several dead specimens found on the sandy-mud flats at Kioa Island. It may easily be distinguished by its peculiar color and constant white line. The low distant ribs give the whorls a polygonal outline when seen from above.

145. *Turricula vittata* Swainson. Reeve, Conch. Icon., pl. vii., fig. 50a, 50b, 50c.

We were very fortunate in discovering five living examples of this superb species, which were found on sandy-mud bottoms in sheltered bays at Vanua Levu, Viti Islands.

Reeve's poor and indifferently colored figures give but a slight idea of the beauty of this scarce shell.

Our examples, the largest of which is $2\frac{1}{2}$ inches long, are of a rich orange-yellow or orange-red, encircled with a broad white zone, which sometimes carries a median narrow brown line. The lower portion of the body whorl has a second but smaller band of a pale yellow color. Both bands are edged with dark brown fillets, and the upper one occupies the lower half of each whorl of the spire. Aperture white, more or less stained with orange.

The upper portion of the body whorl is somewhat angulate and slightly concave above the angle.

146. *Turricula variata* Reeve, l. c., pl. xxvi., fig. 209.

Mitra fratercula Garr. Proc. Zool. Soc., 1872, p. 482.

This rare and pretty species, which is seldom found in good condition, occurs under dead coral on the outer reefs and ranges from the Paumotu to the Viti Islands.

The five examples now before me are shaped exactly like Reeve's figure and agree very well with his description. The upper portion of the whorls can scarcely be considered angulated as stated by the above author, but roundly shouldered the same as represented in his figure, which is quite distinct from the angle on *concinna* and *crocata* figured on the same plate.

The impressed striæ are not fine, but on the contrary are rather coarse, distant, and more like transverse linear punctures than striæ. The upper portion of the ribs are slightly noduled. The color is pale luteous or white, encircled by several chestnut-brown lines which are usually grouped in pairs.

My *fratercula* is undoubtedly the same as Reeve's species. The ribs are smaller, more numerous, and their upper portion is divided by an incised line, forming a row of yellowish nodules.

Animal light brown, freckled with yellowish-white.

147. *Turricula vulpecula* Linnæus. Reeve, l. c., pl. viii., fig. 55a, 55b, 55c.

We obtained a number of living examples of this handsome species by digging in sandy-mud, at low water mark in sheltered bays in the Viti Islands.

None of our specimens are so large as the Philippine shells figured by Reeve. The color is whitish-yellow or orange-yellow, with from one to three blackish-brown belts on the body whorl. Some of the specimens have the above colors and markings reversed, being of a dark brown or blackish-brown with yellowish or orange-yellow bands.

The animal is delicately mottled with purple-black, gray and white. The long siphon is blackish-violet, dotted with creamy-white.

148. *Turricula Zebuensis* Reeve (?), l. c., pl. x., fig. 73.

T. incisa Garr. MS.

A very rare Viti Island species, of which we found four examples (dead), on the Kioa shore reefs.

Having serious doubts of the correct determination of this species I have added the MS. name by which it has been known in my collection for the past several years. If really distinct from Reeve's shell, and cannot be referred to any described species my name can be retained. I add the following description.

Shell acuminate turreted, somewhat fusiform, rather thick, slightly shining, base contracted, somewhat produced; color creamy-yellow, variegated with different shades of ferruginous-brown disposed in a rude transverse band on the body whorl and irregularly tessellated above; whorls 10-11, convex, last one faintly angulate above; longitudinally ribbed, ribs small, numerous, convexly-angular, the same size as their interspaces, and the whole surface with rather close deeply incised spiral lines; aperture creamy-yellow with a faint pinky tinge in front, a little less than half the length of the shell; columella four plaited.

Length 27, diam. 9 mill. (Coll. Garrett).

Our shells though very nearly similar in shape are considerably smaller than Mr. Reeve's figure of a Philippine example. He describes the surface as being "*very finely cancellated with rather flat closely set ridges of which the longitudinal are the larger,*" which will scarcely apply to our shells, unless he considered the interspaces between the incised lines to be ridges.

149. **Turricula** sp.

A single dead specimen found on the Kioa reef, Viti Islands.

It is a small elongate-oval species, cancellated with

longitudinal and transverse ribs, and the whorls angulately shouldered. Color brownish with a white band beneath the suture.

Length 17 mill.

This and the following undetermined species are deposited in the Museum Godeffroy, Hamburg.

150. *Turricula* sp.

One example of this minute species occurred in beach sand at Anaa, Panmotu Islands.

It is closely allied to *T. rubra*, but differs in its more angulate ribs, less swollen whorls, coarser striæ and has no brownish spots or lines. The color is light pinky-red with a revolving white band.

Length 7 mill.

151. *Turricula* sp.

A few specimens were found buried in sand at low water mark at the Caroline Islands.

152. *Turricula* sp.

Three examples found in beach sand at the Panmotu Islands.

153. *Turricula* sp.

One specimen obtained on the shore reef at Kioa, Viti Islands.

154. *Turricula* sp.

Five specimens obtained from beach sand at Anaa, Panmotu Islands.

155. *Turricula* sp.

Two examples found on the Kioa reef, Viti Islands.

156. *Turricula* sp.

A single weathered example found in shallow water at the same locality as the preceding.

Genus CYLINDRA Schum.

157. **Cylindra nucea** Gronovius. Reeve, Conch. Icon., pl. xii., fig. 86.

Excepting the Marquesas, we obtained this somewhat rare species at all the South Sea groups. The habitat "New Zealand" usually assigned to this species is undoubtedly wrong.

Our examples, which are smaller than Reeve's figure, are white, with or without transverse rows of small brownish dots, and when in good condition are invested with a very thin translucent tawny-yellow epidermis, which is more or less stained with brown-black.

The animal is diluted white; the foot and siphon margined with dashes of black and white.

158. **Cylindra dactylus** Linnæus. Reeve, l. c., pl. xii., fig. 88.

Occurs in the same station as the preceding species—that is, in sand or sandy-mud inside the reefs. They were obtained at all the groups except at Cook's Island. It appears to be scarce everywhere.

Our largest examples, which were found at the Viti Islands, are larger than Mr. Reeve's excellent figure of a Philippine specimen.

159. **Cylindra crenulata** Lamarck. Reeve, l. c., pl. xxiv., fig. 190a.

Found in the same station, and is as widely diffused as the preceding species. It is rather a scarce shell at all the groups.

Our largest Viti example, which is nearly two inches long, is considerably larger than Reeve's figure.

160. **Cylindra fenestrata** Lamarck. Reeve, l. c., pl. xxiv., fig. 189.

A common Society Island species found buried in sand in shallow water inside the reefs, and *not* under stones as stated by Reeve. It is very rarely found at the Panmotu and Viti groups, and has been recorded from the Pelew and Caroline Islands. u

The three Viti examples which I obtained are much smaller and more slender than Eastern shells, and are nearly a uniform white color. Mr. Reeve's figure is colored pale bluish-green, though he very correctly describes the ground color as whitish. The transverse lines are brownish or jet-black. The columella is eight-plaited—not nine-plaited as stated by Mr. Reeve.

Genus IMBRICARIA Schumacher.

161. *Imbricaria Olivæformis* Swainson. Reeve, l. c., pl. xxvii., fig. 212.

We found this species inhabiting all the groups except the Marquesas, Cook's and Tonga Islands. It appears to be rather scarce everywhere except the Society Islands, where it is very abundant and gregarious in sand inside the reefs.

It appears to be an aberrant form intermediate between *Cylindra* and *Imbricaria*, and might with equal propriety be referred to either genus, though it is usually placed in the latter. Mr. Swainson considered it to be a *Mitrella* (= *Swainsonia*), the type of which is *Mitra fasciata*. It attains a larger size than represented by Reeve's figure. The color is ivory-white, under a very delicate luteous epidermis. The punctured spiral lines are confined to the upper portion of the shell.

The animal is creamy-white, with a cream-yellow creeping disk.

162. *Imbricaria conica* Schumacher. Reeve, l. c., pl. xxvii., fig. 216.

This species, which appears to be confined to the islands south of the Equator, was obtained at all the groups except Tonga and the Marquesas. They occur in sand in sheltered places inside the reefs, and are gregarious. During two years exploration in various parts of the Viti Islands, I found only one large colony in a small patch of sand in the Kioa shore reef.

163. *Imbricaria punctata* Swainson.

Mitra ossea Reeve, l. c., pl. xxvii., fig. 219.

Not very plentiful and ranges through all the groups south of the Equator. Station the same as the preceding species.

It will be observed that I have restored Swainson's name, which has precedence over Reeve's *ossea*.

164. *Imbricaria virgo* Swainson. Reeve, l. c., pl. xxvii., fig. 214.

Found (rarely) in all parts of Polynesia, except the Marquesas. Lives in sand at low water mark. The coloration is the same as *Olivæformis*.

165. *Imbricaria Vanicorensis* Quoy & Gaimard. Reeve, l. c., pl. xxvii., fig. 220.

Somewhat rare and only occurred to our notice at the Viti Islands, where they were found in sandy-mud near low water mark.

The spire and upper part of the body whorl is ashy-grey, and the lower parts brownish-grey, and everywhere dotted with flake-white and brown.

Genus MITROIDEA Pease.

Proc. Zool. Soc., 1865. p. 514.

Mauritia, A. Adams, Proc. Zool. Soc., 1869, p. 273.

This genus was established by Mr. Pease for a singular species of *Mitridæ* shaped like *Dibaphus*, Phil., but has the spire much more produced and the columella with numerous small slightly oblique plaits.

166. *Mitroidea multiplicata* Pease. Proc. Zool. Soc., 1865, p. 514.

This species, which appears to be very scarce, was obtained at the Panmotu and Samoa Islands. A single example was found at each of the above groups. The Panmotu shell, which was living when found, occurred under a large block of dead coral on the shore margin of the outer reef at Makaimo, one of the large windward islands.

The Samoa specimen, which is larger than the former, was obtained in a dead condition, but very perfect, on the outer reef at Upolu. Mr. Pease's type was taken at one of the guano islands in Central Pacific.

Our shells are pure white, with distant, transverse, hair-like brownish-yellow, slightly impressed lines, under a smooth, shining, luteous epidermis. The whole surface is striated with very fine transverse impressed lines, which are most conspicuous towards the acute apex. The narrow, contracted aperture occupies three-fifths of the length of the shell, and the columella exhibits 9—10 small plaits. The thick smooth outer lip is slightly involute. The outlines of the spire are flatly convex, and the whorls nearly plain. The body whorl is slightly convex, and the base is truncate and deeply notched.

Length 30, diam. 12 mill.

Genus DIBAPHUS Philippi.

Arch. Wieg., 1847, p. 61.

The close resemblance of this remarkable shell to certain species of *Conus*, particularly *C. mitratus*, (which is also

nearly the same color), and more distantly allied in shape to *Strombus terebellatus*, has induced our most eminent authorities on classification to assign it a position intermediate between the above two genera.

It is surprising when Mr. Pease published his genus *Mitroidea*, he should have failed to allude to its very near relationship to *Dibaphus*. The only difference between the two genera consists in the former having several small columellar plaits, whilst in the latter the anterior half of the columella is simply roughened by a continuation of the small elevated transverse ridges which mark the external surface of the shell.

That portion of the pillar-lip immediately above the prolonged ridges, is, as in all *Mitridæ*, perfectly smooth, so that they may be considered rudimentary plaits. In every other particular, as regards detail of structure, the two genera are precisely alike, with the exception of *Mitroidea* having a more produced spire and a smooth shell.

The animal as stated in my paper on *Mitridæ*, published in the Pro. Zool. Society for 1872, has the external structure of a *Cylindra*, which is widely different from that of a *Conus* or *Strombus*.

167. **Dibaphus Philippii** Crosse.

Conohelix edentula, Swainson, MS.

Conus edentulus, Reeve. Conch. Icon., *Mitra*, pl. xi., fig. 80.

Dibaphus edentulus, Philippi, Arch. Weig., 1847, p. 61, pl. iii., fig. 1—3.—Chenu, Man. Conch., vol. 1, fig. 1569.—Garr. P. Z. S., 1872, p. 843.

Dibaphus Philippii, Crosse, Rev. Zool., 1858, p. 4, pl. iii., fig. 1.—Pease, Jour. Conch., 1871, p. 98.

This singular shell, which appears to be rare, was obtained at all the groups south of the Equator, except the

Tonga and Marquesas Islands. They were found lurking beneath dead coral on the outer reefs. M. Crosse records it from the Marquesas and New Caledonia. Mr. Pease obtained two examples from the Caroline Islands, and M. Paetel records it from the Philippines. My largest specimen was taken at one of the guano islands in Central Pacific.

The ground color is whitish more or less stained with yellowish-brown, and ornamented with two transverse rows of large, irregular, reddish-brown spots which are frequently confluent. The whole surface is roughened by small, transverse, angular ridges, which are about the same size as their interspaces, which latter are longitudinally elevated lines. The ridges on the basal portion, which are more oblique than those above, wind round the pillar-lip so that they resemble rudimentary plaits. The resemblance is the more obvious in consequence of the lip being perfectly smooth on the upper portion.

M. Crosse, who has published an accurate and interesting history of this shell illustrated with two good figures, has changed Swainson's MS. name *edentulus* to *Philippi*, which latter must I presume be adopted in preference to the former negative denomination.

The following species, not found by the writer, are recorded from the Polynesian Islands :—

1. *Mitra limbifera* Lam. Reeve, Conch. Icon., pl. xxiii., fig. 180. Marquesas Islands (Paetel).
2. *Mitra ordinata* Pease (Ubi). Sandwich Islands (Paetel).
3. *Mitra crassa* Swain. Reeve, l. c., pl. ii., fig. 7. Tonga (Græffe).
4. *Mitra catenata* Swain. Reeve, l. c., pl. xxxii., fig. 259. Panmotu Islands (Cuming).

5. *Mitra encausta* Gould. Ex. Ex. Shells, p. 274, fig. 356. Viti Islands (Gould).
6. *Mitra pudica* Pease. P.Z.S., 1860, p. 146. Sandwich Islands (Pease) = *M. nux-avellana* Dohrn. (Pease).
7. *Mitra Samuelis* Dohrn. P. Z. S., 1860, p. 368. Sandwich Islands.

Mr. Pease refers this with a doubt to *M. astricta* Rve.

8. *Mitra sectilis* Pease. Amer. Jour. Conch., 1867, pl. xxiii., fig. 2. Caroline Islands (Pease).
9. *Mitra saltata* Pease (Thala). Amer. Jour. Conch., 1867, p. 216.
10. *Mitra lubrica* Pease, l. c., p. 272, pl. xxiii., fig. 2. Caroline Islands (Pease).

Mr. Pease described this species under the name of *glabra* (not of Swainson), and subsequently changed it as above.

11. *Mitra fulvenscens* Swain. Reeve, Conch. Icon., pl. xxxi., fig. 255. Panmotu Islands (Cuming).
12. *Mitra nigra* Chem. Reeve, l. c., pl. v., fig. 33. Panmotu Islands (Cuming).
13. *Mitra approximata* Pease (Ubi). Sandwich Islands (Pease).
14. *Mitra infecta* Reeve, l. c., pl. xi., fig. 75. Panmotu Islands (Cuming).
15. *Mitra circulata* Kien. Reeve, l. c., pl. xi., fig. 77. Viti Islands (Græffe).
16. *Strigatella decurtata* Reeve, l. c., pl. xx., fig. 154. Samoa Islands (Græffe).
17. *Strigatella nigricans* Pease. Amer. Jour. Conch., 1867, p. 215. Caroline or one of the guano islands in Central Pacific.
18. *Turricula Wisemanni* Dohrn. P. Z. S., 1860, p. 367. Sandwich Islands (Dohrn).

Mr. Pease considered it to = *T. bella*. Von Paetel

catalogues it as distinct from the latter species.

19. *Turricula armillata* Reeve. Conch. Icon., pl. xxxvii., fig. 315. Panmotu Islands (Cuming).
20. *Turricula catenata* Swain. Reeve, l. c., pl. xxxii., fig. 259. Panmotu Islands (Cuming).
21. *Turricula elegans* Reeve, l. c., pl. xxix., fig. 233. Viti Islands (Gould).
22. *Turricula elegantula* Dunker. Malak. Blat., 1871, p. 154. Samoa Islands (Græffe).
23. *Turricula pupula* Dkr. Cat. Mus. Godeffroy, No 4, p. 84 (name only). Samoa Islands (Græffe).
24. *Turricula aureolata* Swain. MS. Reeve, Conch. Icon., pl. xxvi., fig. 210. Samoa Islands (Græffe).
25. *Turricula venustula* Reeve, l. c., pl. xxvi., fig. 204. Caroline Islands (Schmeltz).
28. *Turricula modesta* Pease (not of Reeve). Amer. Jour. Conch., 1867, p. 202, pl. xv. Caroline Islands (Pease).
Very closely related to *T. Grunerii* Rve.
29. *Cylindra formosa* Pse. Amer. Jour. Conch., 1867, p. 271, pl. xxiii., fig. 1. Caroline Islands (Pease).

RECAPITULATION.

Viti Islands	...	...	120 species
Tonga Islands	...	...	48 "
Samoa "	...	...	76 "
Kingsmill Islands	...	...	43 "
Caroline "	...	...	44 "
Cook's "	...	...	41 "
Society "	...	...	64 "
Panmotu "	...	...	81 "
Marquesas "	...	...	7 "
Sandwich "	...	...	36 "

Western Polynesia yields 145 and Eastern Polynesia 112 species.

On summing up the stations of the various *Mitres*, it is interesting to note that all the species embraced in each section or sub-genus inhabit similar stations.

All the typical *Mitræ* as restricted; together with the subgenera *Scabricula*, *Cancilla* and probably *Mutyca* are sand or burrowing species.

All the species of *Nebularia*, *Chrysame*, *Thala*, and *Voluto-mitra* are reef shells.

The sub-genus *Zeba* are probably sand *Mitras*.

All the species of *Zierlina* are littoral shells.

The *Strigatella* are all reef species.

All the typical *Turricula*, *Costellaria* and *Callithea* are sand species, and all the species of *Pusia* are reef shells.

The *Cylindra* and *Imbricaria* are sand species, and the *Dibaphus* and *Mitroidea* are reef shells.

October, 1879.



HELIX VIRGATA MONST. *SINISTRORSA*, AND *H. CA-
PERATA* VAR. *ALBIDA*, NEAR YARMOUTH, ISLE OF
WIGHT.

By C. ASHFORD.

I lately took a perfect shell of this form, which is rather rare, from the roadside hedge near Afton toll.gate. It is of the common uniform brownish-yellow color. The briefest examination of the apex shows that it *began* wrong in ovo, and was not perverted during infancy by external conditions. Near the same spot I also found a beautiful albino of *H. caeperata*, the mollusk as well as its shell being white. It belongs to the mottled or freckled variety of that species, the transverse streaks of color being replaced by translucent patches.